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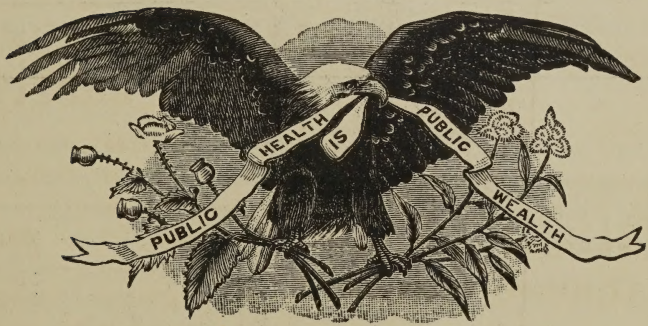

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MICROBIC LIFE IN SEWER AIR.*

By ALFRED CARPENTER, M.D., J.P.

THE peripatetic world is now and then convulsed by agitations against the smells which come from openings into sewers. "Shut them up," say the most energetic and demonstrative. Sometimes this is effected, sometimes it is not. In the heated discussions which spring up in consequence of some stinking outlet argument is useless. The loudest exclaimers often gain the day rather by the loudness of their declamation than by the correctness of their reasons.

I propose to consider the question in its bearing upon the public health in a scientific rather than in a partisan spirit.

The reasons for objecting to smells from sewers are sound enough. It has been proved *usque ad nauseam* that sewer smells do promote sickness. It is reasonable, therefore, that those who object to pay an unnecessary doctor's bill, and at the same time incur the risk of losing one of their beloved ones, should be loud in their antagonism to smells from ventilating gratings.

The first point to be determined is the actual nature of the smells, and (secondly) the causes which produce them. There are various kinds of smells, some pleasant, others objectionable, and some decidedly obnoxious, while there is a class which is utterly offensive. This division is not a satisfactory one, because some smells which are grateful to some persons are most offensive to others. We cannot divide them in this

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way. Another classification might be made according to their manufacture. The odor of flowers and of individuals—human or animal—differ as to their causation from the odor of a gas works, and yet they are allied. These smells arise from chemical changes in the structures of the bodies engaged, which give off minute particles of matter, usually of an ethereal or gaseous character ; and being so are endowed with the attributes which belong to gases, each atom having a repulsive action toward every one of its own kind. These odors are more or less rapidly oxidized when discharged into the air. They do not act injuriously upon human beings except so far as they may take away the ozone or free oxygen which is in the atmosphere, and render the air less vivifying than it otherwise would be, and they cover up other and more dangerous smells. The odors from individuals are also distinctive.

Some individuals smell very disagreeably, but the mere smell is not capable of reproducing its kind any more than those from flowers and chemical decompositions, and are not, therefore, disease-producing. They cannot set up disease in other people. The odors from recently-discharged excreta are allied to this class. They are gaseous, have a tendency to diffuse themselves into space, are rapidly oxidized, and are not in any way Phœnix-like—that is, do not grow another generation of a similar kind. It is true that there are individuals with peculiar idiosyncrasies (as they are called) who cannot bear the smell of musk, or other penetrating odors. I have known one lady who could not stay in a room in which a blooming plumbago was placed without feeling faint, though I could not detect any smell at all from the flower. But these are not cases in point. Stinks of this character may seriously affect a person, but there is *no reproductive power in the smell.* It is this point upon which I wish particularly to dwell, so as to bring before you the true facts and the real nature of so-called sewer gas. The smell of a water closet which has been recently used is very objectionable, but there is no probability of mischief to the next user on that account. It is no more injurious than is rose-water or the kennel of a fox. Fortunately for humanity that it is so. The odors from recent excreta are like to musk ; they are ethereal, and tend to diffuse themselves, and so to become oxidized, and are rapidly de-

stroyed. The excreta from a cholera or fever patient at its immediate discharge is perfectly harmless, but it is highly charged with ova, or germs of organic living matter, which are not so harmless. They are not volatile or diffusible, like to the ethereal smells of musk or of the fox. They require to be separated from the containing liquid, dried, lifted, and carried by currents of air. When so carried they may or may not fall into congenial soils. Any one walking upon the chalk downs on a midsummer day may see the analogue of that which takes place in sewers. The air blowing over the Southdowns lifts up the seeds of the various thistles which grow there, and carries them on to arable fields below or out to sea. In the one case they reach a congenial soil and grow, to the discomfort of the agriculturist ; in the other they are destroyed. So it is with disease germs from sewers.

There is something more than smell or something less, as it has not been proved that disease microbes have any smell at all, and of course it is only those which cause disease that need be avoided, and the sewer must have a tidal state to enable these germs to find exit at the street openings. This brings me to another point in the case. There are benign microbes as well as malignant organisms. There are microbes which are friends to man, as well as those which are inimical. Take a cubic inch of mould from the Beddington Sewage Farm, and it swarms with millions of living creatures, which are hard at work on a warm day preparing the organic matter in the humus by turning its nitrogen into nitrites ready for use by the vegetable world, if it happens that no radicle belonging to a carnivorous plant is at the moment ready to save the necessity for the change. It has been shown by direct experiment that the formation of the nitrites is due to this cause, and that the development of ammonia which takes place under some other circumstances is also a reaction due to another organism of another kind, the result being acid in the one case, alkaline in another. In the one case putrescence is avoided, a nitrite or other acid being formed ; in the other it is hastened, and ammonia results. Here we have another line. How does this alteration come about? The answer is that it comes about very much in the earth or in sewers as it does in the air ; let oxygen abound, especially ozonized oxy-

gen, and nitric acid tends to form. The organisms which cause this tendency grow as vigorously as does the yeast micrococcus in a solution of sugar. When the air is highly charged with electricity the rain which descends in a thunder-storm contains an appreciable portion of nitric acid. But let the presence of oxygen be diminishing, and compounds of nitrogen form which are alkaline, and putrefaction is then promoted. A set of microbes come into being which are sometimes inimical to humanity ; but here again we see the overruling hand of a Divine Providence, for one of the products of putrefactive agency—viz., sulphuretted hydrogen, is completely destructive to those organisms that especially revel in the humors of animal life. This result is shown in the work of the doctor. It is our duty as students to do some dissecting in our student days, and we may be requested to do so at any time by the coroner. It sometimes happens that the operator wounds himself. I have experienced this while making post-mortems upon those who have only been dead for forty-eight hours, more or less. This class of wound is always very serious, for disease germs may be transplanted ; but a wound which is inflicted at the end of a dissection, when putrefaction is established, perhaps six or eight weeks after the death of the subject, has very little danger in it, for the disease-producing microbes, if they had been present, have all been destroyed in the process of the putrefactive action which has taken place. This result happens in sewers as well as in dissecting rooms.

There are two classes of microbes which have to do with destructive agencies—the moulds, which belong to the family of fungi, and the true microbe or schizomycites order. If air be sparsely admitted the moulds predominate, and there is a tendency to acid formations, carbonic acid, butyric, nitrous acid, etc.; but if it is all but excluded the schizomycites are most numerous, and it is on this fact that ventilation must be good or not at all. We now reach a point in our inquiry which is of importance. Microbic life is connected with decomposition of organic matter containing nitrogen in its constitution. Decomposition is accelerated or checked by outside circumstances, such as the presence or absence of air ; it is also influenced by temperature, by moisture, and the presence or absence of other agencies, as is proved by the action of antisep-

tics and germicides. We may even advance a step further and say that without decomposition there is no development of microbic life ; this is an important factor in the consideration of sewer air.

Let us now inquire as to the nature of the decomposition which promotes the formation of these organisms. As experience is gained we become more and more convinced that there is no known means whereby any such organism arises without the previous introduction of a parent germ of the same kind ; that the spontaneous origin of such germs is not likely to happen, though no doubt in the case of some kinds of disease germs, such as that of typhus-fever, the dormant organism is an ever-present commodity, as much as that which gives rise to the blue mould in cheese. It is also established by experiment that a germ may be made more malignant by cultivation, or by cultivation may be deprived of its malignancy. It is upon this fact that vaccination is found to be prophylactic against small-pox, and Pasteur is able to prevent the spread of splenic-fever among cattle, and take out the sting of hydrophobia, by giving rise to a disease of a similar but of a milder type, though in the last-mentioned this may be only a choice of two evils.

Let us now ask whether any microbes are to be found in sewer air? Secondly, whether they are necessary parts of a sewage system? Thirdly, whether being there they are benign or malignant? And fourthly, whether it is possible for those which are benign to become malignant by cultivation in the sewer or outside, and *vice versa.*

My attention was first attracted to sewer air in the years 1853, 1854, and 1855. We had a ventilator fixed to the sewer at the Friends' School in 1854, which was then in Park Lane, Croydon. One of the teachers, who was of an inquisitive turn of mind, got on the roof and smelt at the opening, with the sequence of a severe attack of sickness. It was the first case in which I was able to draw a distinct inference as to cause and effect with which I came into contact, though I was then satisfied that sewer gas did cause much illness in the town. It was not long before that event that I had ventilated the soil-pipes of my house, then in the Dingwall Road, the first ventilator of the kind which was put up in Croydon, and by that

means, I think, saved my household from the invasion of typhoid-fever, which affected my neighbors in every house in that road right and left of me. From experiments carried out at that time in various houses in Croydon I was satisfied as to the dangerous character of sewer air when coming from unflushed, unventilated sewers, and I determined to do my best to get the Croydon system of sewers both flushed and ventilated. It was not, however, until after the year 1865, with its distressing events, that the local authorities would agree to adopt the principle that every individual house should have its own protector from the invasion of obnoxious gases. About that time the experiments of the German scientist, Professor Keber, of Dantzic, who followed up Erzenburgh's discoveries, had made out the connection between living organisms and disease, such as that which produced splenic-fever in cattle and relapsing-fever in human beings. I began my own experiments on sewer air about this time, and tried to get some facts from personal observation which should be worthy of a place in the literature of this society. I had proved to my own satisfaction that *potato blight* was caused by a mould fungus (the *Peronospora infestans*), though I did not, for one moment, claim to be the discoverer, but only verified that which was suggested by others. I had learned that *dry rot* resulted from another fungus (the *Meruleus lachrymans*). I detailed my observations upon *Peronospora infestans* in the *Times* newspaper, with the result of drawing upon me the anger of those who were working in the same field, perhaps in a more conclusive measure than I did, but of whose work in that particular field I was, like most other people at that time, quite unaware. I followed out my observations upon sewer air by suspending microscopic slides in those positions in which sewer air was distinctly found to make its exit. It was while I was so engaged that I made out that a number of Mr. Latham's charcoal baskets were inserted into openings into which air sometimes entered. These baskets had been provided to obviate the mischiefs from sewers by purifying the air by means of charcoal; some were openings for the admission of air rather than as exits. This was especially the case with two or three openings at or near to the Zion Nursery, which had been complained of as nuisances, but which were conclusively

proved to my own satisfaction to be completely innocent of offence, for air went in instead of coming out, though it is quite probable that there was a reverse action occasionally. It was evident to me that the smell then complained of came from some other source than the sewer grating. The examination of the slides that I placed in the gratings showed a variety of organisms such as had been found in the wards of a large hospital, but I could not recognize any that I could accuse of being typhoid or other disease germs, which were the organisms I was more especially searching for. The arrested organisms were vibrios micrococci and vegetable germs, innocent of malignant action on man, as far as our knowledge then extended. I was not at that time aware of the plan of cultivation by means of gelatine solutions such as are now so successfully used in similar investigations—some of these I exhibited on a former occasion to the members of this society. I exhibited also some specimens and diagrams prepared by Dr. Heron, showing these developments, when I last addressed the society upon the subject of disease germs.

My last attempt at investigation in this direction was made upon a ventilating opening at the side of my garden upon Duppas Hill Terrace. The results of that investigation have been published in St. Thomas' Hospital reports for the year 1883. They involved a medical question which I was anxious to submit to the medical profession, and did not detail them to this society. The substance of my observations, which were carried on in the winter of 1880-81, was that certain smells came from that ventilator which varied in nature as well as in intensity. Sometimes the smell was excessively offensive from the presence of sulphide of ammonium ; at others there was an ordinary sewer air smell ; and at others a sweet, hay-like odor which could not be called distinctly offensive. I never smelt that particular smell at that sewer without getting a relaxed throat and a cough in the next day or two, and on two occasions a distinct feverish attack lasting for forty-eight hours. There was one point of importance in the microscopical examination of the slides which I suspended in the ventilator—viz., that whenever the sweet, hay-like smell existed some very minute highly refractive organisms, smaller than the ordinary micrococci, were seen, which were always absent

when the sweet hay smell was perceived. I never suffered from relaxed throat after inhaling the sweet hay smell, and I came to the conclusion that the highly refractive particles were the germs which gave me the relaxed throat, and that they were non-existent when putrefaction was thoroughly established. If I had known anything of gelatine cultivation then, I should certainly have cultivated those germs and tried to prove their connection with somewhat similar organisms which are found in diphtheria and croupous or infectious pneumonia. (Some cases of these diseases did exist on Duppas Hill about that time.) It was while making these investigations that I discovered a defect in my own left eye, which led me to give up microscopical research, and which has since disabled me from assisting at the society's microscopic demonstrations.

Since that time I have been educating myself by the microscopic studies of others in the same direction. It has been clearly proved by experiment that actual putrefaction is generally destructive of the life of disease germs, so that the only result which need follow the inhalation of the offensive odors from sewers is the necessity of calling the attention of the local authorities to the fact that the sewer is a sewer of deposit, and before the stink escaped might have been a source of danger to those passing by that locality. We may depend upon it that it is not the sewers which stink that are the most dangerous, though before putrefaction was complete it was possible that there might have been disease germs escaping from that particular opening, though I shall show presently that they need not excite serious alarm.

Let us go back to

THE HABITAT OF THE GERM.

Many attempts have been made by various observers to catch the organism. So difficult is this that Professor Nageli, of Munich, endeavored to show by a series of experiments which he carried on for some years that they are not given off by moist surfaces, and Professor Frankland said, in 1877, that nothing particulate was given off from running sewage ; but as he has also shown us since then that the bursting of bubbles disseminated particles of lithia in solution, it is evident that

whenever bubbles burst any particulate matter in the substance of the bubble might be disseminated as well as the lithia. Some experiments have been made by Mr. J. S. Haldane in the Westminster Palace sewer, which go to prove that micro-organisms were few whenever there was a regular current of air; that with little or no draught there was an increase of carbonic acid, and with that an increase of micro-organisms, but they were moulds rather than bacteria. But another very curious thing was found to exist—viz., that when the ventilation within the sewer was much improved, so that Co-2 was materially diminished, there was a considerable increase in the number of bacterial organisms, as if a diminution of oxidation allowed of the increase of germs.

Mr. Haldane examined the air in the Bristol sewers, which are not ventilated. He found that in those sewers the moulds exceeded the bacteria, while in the air of the streets the bacteria exceeded those of the mould.

Hesse has shown us that although the spores of the moulds are much larger than the bacteria they remain suspended in the air much longer than do the bacteria. Mr. Haldane concluded that it is to the presence of air from without that we owe the more prolific existence of bacteria in sewers, and not *vice versa*. His experiments led him to conclude that true sewer air contained fewer micro-organisms than the air of a street, or even the air of an ordinary living room. Our experimenter did find, however, that when the sewage was splashed about there was a large increase in the number of organisms observed, which is a great argument against the formation of large sewers. It is argued that there is much doubt as to the power of sewer air to disseminate typhoid germs independent of water supply. My own experience, arrived at by passing through three epidemics of that disease in Croydon, fully convinced me that when sewers, such as some of ours were in 1875, are loaded with typhoid excreta, the germs which are capable of reproducing the disease do get conveyed from sewers into human beings by aerial means, either directly by air or through the water supply. In those epidemics the very large number of domestic servants, especially kitchenmaids and cooks, who became victims to the disease, was one of their marked characteristics, the reason being that those per-

sons went downstairs into the basements in the early morning before the house was thoroughly ventilated, and inhaled the sewer air that had collected in the kitchen during the night. Then there was Dr. Buchanan's demonstration as to the reason why fever existed on one side of two or three streets which he specified, in which the water supply was the same, and the sewer the same. In one set of cases the air was admitted into the houses from the sewer ; in the other it was not. It is clear, however, that

ORDINARY SEWER AIR CANNOT PRODUCE MISCHIEF

unless the organisms from particular forms of disease exist in the sewer. It becomes the bounden duty of the authority to take care that no such organisms continue to live and multiply there, and that when cases of any infectious disease exist in a given locality they shall pay particular attention to the sewers in that locality, and prevent them from discharging disease germs into the streets from the open grids which are left for ventilating purposes. They will do this if they are only partially ventilated, and are sewers of deposit.

We are now in a position to answer the four questions which I have put forward.

1st. Do microbes exist in sewer air? No doubt they may. If sewers are properly laid, and there is no sewage deposit, no impediment to discharge allowed to take place, and no part of a given length allowed to have stagnant air in any part of it, there will be no disease germs.

Disease germs require time for development, and if excreta be hurried away to their proper destination, where they become *bonnes bouches* for the carnivorous plants which should be found on sewage farms, there is an end of their *rôle* as disease germs. But if the sewers are sewers of deposit some may settle on the pipes ; they may fructify there, and their living, growing spores be carried away by the currents of air and then discharged, to the possible danger of the people. They are not, however, the necessary parts of a sewer system, but are the accidents of defect. I have not the least doubt myself that a stinking grating is not dangerous, from the circumstances I have mentioned. It is an undoubted fact that the year which produced a panic in the House of Commons, and

by which the Metropolitan Board of Works was brought into being, was produced by the stinks from the bed of the Thames. It was the healthiest year that London had experienced for a long time, as far as enthetic disease is concerned, at least, if statistics prove anything, and yet the Thames smelt so badly that our senators could not carry on their work in the committee rooms of the House of Commons.

Stinking sewers should not be allowed to exist, but to my mind it is better to have the open grids in the streets than to convey the mischief, which is possible, into positions preventing our getting the knowledge that the sewers require to be scoured. Every line of sewer should be well scoured in the crown of its arch as well as at the bottom, and after the scouring thoroughly flushed by a body of water that fills its calibre completely. The flushing which I see going on in our town from a two or three-inch tube is all but useless for the purpose required, except where there is a stoppage, which produces a head of water and fills up the sewer.

Sewers of comparatively small size, in exactly straight sections, so that they may have the lamp test applied, and which sewers can be flushed by the sudden discharge of a large body of water at frequent intervals, when the temperature of the sewer rises above a certain point, will remove the colonies of disease germs. They do grow on the sides and invert of the arch of sewers, as certainly as they may be made to grow in tubes containing pure solution of gelatine. If the ventilation is tardy, so as to allow of fructification, the colonies give off their spores, and these may possibly infect a passer-by, who happens to be infective, and upon whose mucous membrane the organism happens to fall. I say this is a possible contingency, but it will rarely happen. These germs are of two kinds : the one is a living, growing organism, which I may compare to the barley which has been made to sprout in preparation for malting. If this organism be planted on a mucous surface ready for its reception it may take root, reproduce its kind, and set up its own form of disease ; but, like to the white corpuscles in human blood, exposure to pure air for a very short period indeed is fatal to them. The fact is made out in the operation called transfusion. If the blood in its passage from one person to another be exposed to the air for more than a

small fraction of a second, the corpuscle dies, and the patient, though at first reviving, afterward succumbs to the mischief produced by the dead fibrine. If growing germs are exposed to a current of fresh air, free from ammonia and with its fair proportion of oxygen, in the sewers, the germs will be deprived of vitality before they escape into the open air. It is upon this fact that the ventilation of sewers must be complete if such ventilation is to be safe. A partial ventilation does not provide for the death of the living, growing germ, and it is this living, growing germ which does the mischief ; for the other form, the resting spore, will not rise from the watery bed. The growing germ is also destroyed by sulphuretted hydrogen and its binary compounds, the product of the decomposition of all albuminous matters. I say, then, that

WELL-VENTILATED SEWERS ARE SAFE ;

they are doubly so if they are thoroughly and properly flushed. If they are not sewers of deposit they cannot produce sewer gas, and if they thoroughly stink disease germs cannot live in them, so that in either case there is no danger ; but there is a possible danger, when it is not discoverable by reason of smell, if those openings which give out offensive odors are occasionally free from the discharge of stinking matter, and some one who is not germ-proof stoops down at the opening. Children will be, may be, victims. If we bear in mind that in a pure atmosphere the life of the germ is momentary, all serious danger is at an end. I have said in a pure atmosphere. If the air is impure, if it contains alkaline gas in the form of ammonia rather than the nitrous or sulphurous form of gases, there is the possibility of a much longer life than is the case when the air is pure or has an acid reaction. It is to this fact that diseases spread in unventilated, dirty houses, and if it was not for the sulphurous acid which is formed in the London smoke-fogs it is most likely that the life history of disease germs would be made more manifest than it is when we have an atmosphere entirely without ozone for days together.

We may take it as true that living disease germs from sewer ventilators are possible factors, but they are rarely provided. If the sewers are only partially ventilated, with tendency to the formation of carbonic acid in excess, there is a mould for-

mation rather than bacterial life, and moulds are not yet proved to be zymotic disease germs to human beings. They are comparatively benign ; like to benign bacteria, they help to purify both air and water, and return the albuminoid or nitrogeneous matters to their simple elements, ready for use by the vegetable world.

I cannot conceive benign organisms becoming malignant in the processes which take place in sewers unless the temperature be raised much beyond that which is ordinarily found in proper sewers with an abundant water supply. I mentioned, when speaking of sewer flushing, that this process must be frequent at certain times, when temperature is higher than usual. If at any time the temperature in this country should be continually high for a month or six weeks together, so that the temperature of the London water should be kept above 65 degrees for a month, London may prepare for a tremendous outbreak of typhoid in the succeeding autumn. It requires a continuously high temperature for probably a month to develop typhoid spores in the drinking water as at present manipulated at the filter works of the water companies. That season will come some day with the usual result, "panic," and consequent loss. For the same reasons, unless sewers have their temperature permanently raised for some time, there is no danger from benign germs being replaced by malignant ; but I believe that it is possible for the continuous discharge of hot water so to raise the temperature of a drain-pipe that it may be a hidden source of danger, and that such continuous discharges of hot water from manufactories may be dangerous in badly-constructed sewers, though an excessive heat, such as is experienced on a sunny day, destroys bacteria ; but if sewers are well and truly laid, if the pipes are smooth inside and have been properly jointed, if they flush clean, and are properly flushed at intervals, depending upon the temperature of the sewage, then there is no real danger from the admission of hot water into sewers.

I think I have dealt with the four points to which I have drawn attention, and I will conclude what I have to say on this subject, that the greatest danger from drains is not in the public sewer, but in the house connections and in the private drains laid by speculative builders. They are only

occasionally used, they become all but dry at frequent intervals, and if they are not as clean as a back kitchen sink ought to be, they will, in spite of all precaution, occasionally produce sewer air. They must be ventilated even more perfectly than the public sewers, and so cut off from all direct communication with the house that it shall be absolutely impossible for any of the products of decomposition, if they arise, to find their way inside the dwelling and carry living, growing germs with them. If these arrangements are carried into effect, those living in such houses may defy disease germs and live in perfect safety from their attacks, and, in the words of the Psalmist, we may say—(1) Thou shalt not be afraid of any terror by night, nor for the arrow that flieth by day; for the pestilence that walketh in darkness, nor for the sickness which destroyeth in the noonday. (2) A thousand shall fall beside thee, and ten thousand at thy right hand, but it shall not come nigh thee.

NOXIOUS INSECTS are more numerous and destructive now than they were fifty years ago. Where nature has a chance to work out her laws, all animals, from the highest to the lowest, do not increase beyond proper limits. Even man himself is no exception to this great law; but let a break occur in this great natural chain, and it is felt all along the line. Some species will increase enormously, while others almost entirely disappear.

Now, as insects are far more numerous than all the higher animals, it follows that if some unforeseen event takes place that favors a great increase of some noxious species, man is sure to be a great sufferer. And this state of things is exactly what is taking place to-day. The reader will naturally inquire why the beneficial ones do not increase as fast as the destructive ones. The answer is, the food plant of the latter has increased enormously, and all the surroundings have favored its rapid increase, while the other, living upon animal (imago) food, is entirely outstripped by the vegetable eating species. —*Vick's Magazine.*

THE HEALTH OF THE MIND.*

By BENJAMIN WARD RICHARDSON, M.D.

WE have been accustomed, in thinking of the health of the mind, to look upon it as subordinate or secondary to the health of the body. There is a well-known saying which is on every one's lip, *Mens sana in corpore sano*—a sound mind in a sound body—which saying has become interpreted, by common consent, into meaning, that if the body be sound, the mind must be sound. The proverb does not actually convey that idea ; it simply suggests that a sound mind in a sound body is a good combination ; it gives no precedence to the body—nay, it puts the mind first, as if it supposed a sound mind as the precursor of the sound body. *Mens sana.* And this is a perfect reading of it. There have been some philosophers, some, indeed, of the best, who, holding the opposite view to that which is now commonly held, have traced to the mind all the evils which appear in the body. Thus the prince of philosophers, Plato himself, teaches that all evils of the body proceed from the mind ; and Democritus is quoted by industrious and quaint old Burton, in his "Anatomy of Melancholy," as teaching that if the body should bring an action against the mind, surely the soul would be cast and convicted ; that by her supine negligence she had caused such inconvenience, she having authority over the body, and using it for an instrument, as Cyprian says, as a smith doth his hammer. It is not necessary for us now to follow out the subtle argument that is here introduced in regard to the intimate relationships of mind and body. We are fully conversant with the fact that the body can be injured through the body without any direct instrumentality of the mind ; for, in point of fact, all our sanitary labors have been carried out under the conception that the success of our work consists in detecting and removing those obvious external causes of disease by and through which

* Presidential Address before the Health Congress at Hastings, England, April 29th, 1889.

the bodily organs, including the organs of the mind itself, may be and are affected ; but we are not so conversant with the study of the health of the mind primarily, and independently of the body, and of the health of the body as dependent on that of the mind. I propose, therefore, in this address to dwell on this latter topic entirely, and to try and open up some new thoughts in relation to it. On the first outlook, the phenomena which connect themselves with the study of the mental origin of disease present the closest analogy with the phenomena connected with the physical origin of disease. We say, when we are thinking or speaking about the diseases which are of physical origin, that they are the results of uncleanliness ; and we proclaim in relation to the removal and extinction of such diseases that cleanliness is next to godliness. We say of physical causes that they are infectious or contagious in their action. We say, in respect to physical agencies inducing disease, that they are most active in particular seasons of the year. We ascribe to different ages of life different effects of physical influences acting upon the health. We declare of the causes which excite to disease, through physical action, that they are modified, increased, or reduced in intensity, by the quality of heredity ; and when we come to look at causes affecting the health of the mind we discover analogies of the clearest kind. These analogies are facts to be remembered as greatly simplifying our present study. Unfortunately, they do not exhaust it, for there are in the mental phenomena of disease some causes of disease which stand out by themselves as causes, and which perform a double injury in that they affect not only the mind itself, but the body through the mind. There is, moreover, a mutual reaction between the mind and the body, in regard to the health of each, which is most close and important. We know that the state of the body affects the state of the mind ; we know that the state of the mind affects the state of the body. These are facts of every-day knowledge ; we feel within us the two distinct natures, warring with each other, or in accord with each other, or helping each other, and, as it were, reasoning with each other, although it is only the mind which, recognizing itself as well as its body, really reasons. We feel and are strangely conscious of all this, but what we do not feel and do not ap-

preciate, what we have yet to learn to appreciate, is the independency of the two empires of mind and body, as well as the dependency of the one on the other. We are conscious that the food of the body influences the health of the mind, as when we say of some unsuitable or indigestible thing, "It has made me dull of mind, it has made me sad, it has made me irritable, or has in some other way affected my equanimity." But we do not recognize with like readiness and in the same way the effect of the foods of the mind on the mind and its health; nor is this remarkable, for the body feeds perceptibly, and by one stomach alone, while the mind feeds imperceptibly, by five stomachs, by every sense, which is to it a veritable stomach from and by which it receives its aliment, be that good or bad, and from which it is renewed and from day to day sustained. These foods of the mind entering the mental organization, the *camera nervosa*, largely, if not altogether, mould that organization into set form, according to its quality for moulding. They are so like the touch of the sculptor on the clay, that to a great extent all men and women born shape their mental surface according as they are led to give it form and shape. I could not, if I should search for years, find a better simile. Common foods and drinks that make the matter of the body must be healthy in order that the body may be so; and the impressions which enter the body by the senses, the foods and drinks of the mind, must also be healthy in order that the mind may be so. Granting, therefore, that the substance is good, and the moulding or modelling good, all will be good; there will be the *mens sana in corpore sano.* The sanitarian, when he is looking after the pure things out of which the body shall be constructed, the pure food, the pure drink, the pure air, the pure warmth, is fulfilling the physical part of his duty. Whenever he is taking care that with the materials for construction no evil or deleterious thing shall enter, he is performing his legitimate part on the physical side. He is preserving the material of life from physical contamination; he is giving to the bodily form its perfect shape and qualities. To complete his task he must add to his studies the study of the health of the mind, that luminous receptive surface which changes the mere material substance, the clay, and gives it, according to the depth, the purity, the

equality, and the brightness of itself, the health of itself ; its innocence and its sanity ; its approach toward the one pure and sane mind from whence it proceeds, and to which it must return. Let us follow this out in orderly form.

MENTAL PURITY.

In the new study of this to them dual art, the coming school of sanitarians will take up a new sanitation. The students of this school will begin, as their physical predecessors began, by training into health from simple principles ; and, as uncleanliness of mind is the most obvious sign of mental disease, and cleanliness the surest indication of mental health, they will strive to discover the prime sources of mental impurity, and will strive equally to introduce, in the place of the unclean influences, the clean and the wholesome. The field of the research here is as wide as the field of humanity, and of all studies is the most absorbing. It includes the primitive study of the conditions leading to the perfect mould of mental health ; a study old as man is old, and yet young as the youngest of men. It involves the problem of the fashioning of the child from the first moment when it begins to feed on the universe, by its eyes, its ears, its touch, its taste, its smell. It is the study of these first mouldings into the modifications of mind incident to the train of years and changing scenes, from the first gasp of the breath to the last exhalation of that vital spirit. There seems a wide field for discovery here, and yet, wide as it is, there are at once displayed upon it certain plain truths which are immediately practical in their nature and influence as bearing on the health of the mind. One primary truth, for example, at once comes forth, that the mental food most early and most continuously and most repeatedly supplied, is that which, for health or disease, most potently affects the mental surface, and carves its place upon it. But the feeding of the mind governs the appetite of the mind, and by what the senses take in the health of the mind is good or bad, clean or unclean. Each sense makes its own bed. Let the eye for long series of years take in no view save that which is squalid, and common, and impure, and by that custom the mind represents the fashion of what it sees. For art, for beauty, it will lose its primitive adaptability, whatever

that may have been, and after a set time for attaining maturity will remain, in respect to purity of sight, a deformed mind, one that can at best only be partially and imperfectly improved. A mind so deformed is never in perfect health and strength. Why for it shall the earnest sanitarian plead for open spaces, flowers, a clear sky, a clean street, an artistic dwelling—all that makes life strongest and happiest? Why, indeed? The difficulties we sanitarians are compelled daily to meet in our work of reform, lie beyond any description that could here be given in unhealthiness of mental visions. The visions of our forefathers, for what reason should they be altered? Am I not to be content with what is? Why should any changes be introduced in my time? So reason they who, from what is called apathy of mind, cherish the worst and most unhealthy errors. On minds so attuned we waste our powers in argument. As well argue about colors with one who is color-blind. We need not argue. We must get the *young* mind to learn the scenes of the pure and the beautiful, and our ultimate triumph is then secure. Do you ask me to give you some practical idea bearing on this point of mental health and its guardianship? I will give it straight. I will take the illustration from the schoolroom, where the first mental foods are administered. Every man and woman now present is, to a larger degree than he or she has the slightest conception of—until he or she reasons it out from memory and comparison—the reflex of that market of the mind, the schoolroom. The first care of the teacher should be the room of the taught. Let that room be bright, cheerful, healthful, and life begins from a good mental starting-point. Let that room be dark, littery, melancholy, dirty, and the presage of life is injured from the starting-point. Some quarter of a century ago my professional duties led me to the examination of certain schools attached to Union Workhouses, in which children were herded together in rooms unfit for lower animals. They were one and all the victims of low health physically, and the medical officers were in despair what to do with so much chronic and hopeless feebleness as prevailed among them. But this, bad as it was, was only part of the evil. There was the addition of the mental misery and impoverishment. I observed that such schools made poverty,

bred it, nursed it; made misery, bred it, nursed it; made mental disease, bred it, nursed it. I gave great offence for my plainness of speech, for which I had no reason to care, since the disclosure of the existing evils led to important ameliorations, and I knew that from such centres of gloom nothing could come that could lead the so-called scholars into a purer and better mental condition. These observations had reference to schools of a low class and of a past day, since which day there has been a march of improvement. Still the march is slow and very faulty. My eye recalls at this moment schools where the children even of the well-to-do are taught, in which perennial gloom is spread like a pall over the mental life, and in which the effects on the after career are of necessity sad and unwholesome. Better off indeed, now, are the children of the poor in some of the bright country Board schools than the children of the rich in the dismal cloisters where they sit in classes from year to year, within four walls in which the sunlight has no full play, in which no flowers are seen, no pictures, nor any thing of beauty to gladden the sight. These sad schools are to the sight of the mind uncleanly. Let them be reformed, and reformation in the scholar will follow on and on to the end of life; the house will become pure, the study or office will be orderly, the bedroom will be healthy, because the mind has been taught to become pure, orderly, and healthy. In many other ways health of mind through cleanliness of the sight will extend, as the art of attaining mental salubrity is extended. Nor will the sight alone share in the advancement; the sense of hearing will be purified. In the early part even of this present reign, great statesmen, great soldiers, great lawyers, and other great men were given, on occasions, to express themselves in terms and words which in these days would savor almost of insanity, in terms and words that no person of respectable life would now listen to without shame, and still among the most unwholesome and mentally unhealthy of our people the same uncleanliness lingers. Where it lingers health cannot be. Physical health will not be clad in dirty raiment; mental health will not be tolerant of uncleanly language nor of language false or foolish. The true sanitarian must learn to train the ear to the purity of discourse, as he would to perfect music,

or as he would train the skin to purity of water, and the eye to purity of sight. In like manner the olfactory sense comes under the rule of the health of the mind. By the olfactory sense the mind naturally should learn, with an acuteness amounting to genius, the presence of most of the physical causes that lead to the most serious and devastating diseases. Sir Edwin Chadwick, in one of those happy observations which so often fall from him, says that the physical condition of a whole nation might be told by a nose sufficiently critical. And the statement is true. Unfortunately the sense of smell is not yet so freed from the odors of disease as to distinguish, with due refinement, where there is and where there is not every hurtful thing that gives a venomous odor ; but this want of refinement is due merely to absence of purity and to deficient knowledge of the odors that are injurious. The detective sense is blunted, and often so much blunted that the worst odors are unknown to the mind, and being unknown, allow the causes of disease to enter without the vaguest suspicion of their presence. The health of the mind, so strongly affected through the senses of sight and hearing and smell, is not less affected by the tastes of things that reach the mental surface through the palate. What lower mental health can there be, what lower standard of mental condition, than that of the sensual palate that shall find relish in putrefying food, and that, like the lower palates in creation, shall be delighted to feast on garbage ? Yet I myself have twice in my professional career known death to follow the corrupt enjoyment of this disgusting taste. And what again of the bad mental health that cultivates a desire for excessive gluttony of taste, that craves for that rich unwholesomeness of foods and drinks which is as sure to bring disease of body and mind as the mere act of swallowing them is sure ? We shall hear in the present Congress this question of the palate and its tastes discussed on its physical side. But let us not forget the mental side ; let us feel certain that on the mental side also there is a say, and that the mind that is nearest to purity and simplicity, in the matter of cleanliness of that which reaches the first portals of the body, is the nearest to the mind which is healthiest, purest, and best. Neither let us forget, lastly, that the mind is fed by the sense of touch, and that even in

touch there is an art of sanitation. Refinement and firmness in this sense is one of the choicest evidences of good mental health ; want of refinement, want of firmness, want of precision, is one among other proofs of bad health of mind. Thus the sense of touch becomes as it were a gauge or test as well as an aid to the maintenance of mental health. If the day should ever come, as I trust it may, when the sanitarians, with their full forces arrayed, shall form a school for teaching all that pertains to their work, they will find in this department of it full scope for the establishment of a professorship treating solely of the food of the mind for the health of the mind, and thereby of the body likewise ; the clay, and the spirit that not only moulds the clay, but fills the mould.

MENTAL CONTAGION.

The illustrious French philosopher Esquirol first clearly defined, under the term "moral contagion," that in the study of mental phenomena there may be detected variations of action, and divergencies from the ordinary or natural conditions, which are excited by contagion, in the same way as physical derangements are excited by physical contagions. Despiné, of Marseilles, who in many respects may be compared with his great master, Esquirol, has followed this line of study with wonderful success, and has given to us a history of moral contagion which claims the attention of every social scholar. For my part, I like and approve of all that these teachers teach, except the term they use to set forth their argument. I prefer the term mental contagion to that of moral contagion. Moral contagion I cannot conceive as conveying any sense of variation from a standard health of the mind, and any contagion moral in its nature would to me indicate a contagion that was good, and contrary, in its nature, from the idea of contamination usually connected with the word contagion. I, therefore, choose the term "mental contagion" as being more to the point, and as most in accord with the commonly accepted expression. We will study this division of our subject under that title. The unhealthy mind affected by mental contagion presents itself, when it is carefully observed, over a much more extended field than is generally supposed. It is, in fact, a representation of a series of phenomena so widely

spread that its very extent is a cause of its obscurity: we are so familiar with it that we do not recognize it; we are so familiar with its results that we come to look on them as occurrences sufficiently common and natural to be unavoidable. It is only when we are critical in our analysis that the obscurity begins to pass away, and the character of the phenomena appears in all its clearness and extensiveness. When these phenomena are recognized it is astonishing how contagious affections of mental origin are seen to resemble in their course those arising from simple physical contagions. Sometimes they take a spreading or epidemic character, after the manner of the so-called catching diseases with which we are most familiar, and are seen to widen into great epidemic outbreaks, extending over large tracts of country, and causing the strangest of effects known in history. One of these marvellous outbreaks of mental contagious disease, not to name any more, was the dancing mania of the fourteenth century, during which assemblages of men and women who had come out of Germany to Aix-la-Chapelle, united by one common delusion, formed circles, hand in hand, and, appearing to have lost all control over their senses, continued dancing, regardless of the bystanders, for hours together, in wild delirium, until at length they fell to the ground in a state of utter exhaustion, panting, senseless, and laboring for breath, yet not infrequently rising, after a rest, and continuing the motion until, in many instances, they died from the effort. At other times these outbreaks from mental contagion, in which one victim has followed another, has taken what, in regard to more ordinary known diseases, is called the sporadic form—that is to say, has been developed, or has broken out, in some particular locality, and has not extended beyond the boundaries of the locality. An outbreak of a convulsive type, arising from fear, once occurred at a manufactory at Hodden Bridge, in Lancashire, in which outbreak over twenty persons, taking the contagion from one individual, were attacked most severely, but without communicating the affection beyond the place where it broke out. Like the common contagious diseases, these diseases of mental contagion have been known to have their seasonal proclivities. The ordinary spreading diseases, such as measles, scarlet-fever, cholera, typhus, have each their

favorable seasons of intensity and decline, their maximum and their minimum periods. It is the same with the affections of mental type which spring from contagious influences. In the Shetland Islands a contagious mental affection, which was ultimately cured and prevented by moral means alone, broke out in the year 1817 during the summer months, and recurred every year during the same months until it was finally disposed of. In like manner suicide—which may be looked on as a distinct form of mental disease—is of so contagious a character that during the reign of the first Napoleon the sentry-boxes of a station had to be burned, because one soldier, having set the example of hanging himself in a sentry-box, was followed by so large a number more. Suicide also has its season of height and decline, its maximum being reached in June and its minimum in February, like a true epidemic. Another singular and important characteristic quality of the contagious mental diseases—one of immense importance to remember, and one which links their phenomena very closely with those of the common contagious diseases—is what may be called the line and order of their development and decline. The common contagious diseases usually commence from a single point, rapidly increase in intensity, and then decline often as suddenly as they have come on the field. The same is seen in the contagious mental diseases. Despiné illustrates this very cogently from the contagion of the duel. At first, he shows, it is necessary to have some great cause to raise the disease of mind which leads to a first contest of duelling. But let the contagion go on, and soon the merest pretext is sufficient to excite the phenomenon, until at last it ceases altogether for the time, as if it were worn out by its own excessive fury and folly. That I might bring out in strong relief the contagious acts by which the health of the mind may be affected, I have cited strong instances, some of which may be considered as belonging rather to a bygone than to the present age. I admit the fairness of the criticism, but the lesson, unfortunately, remains. The student of the present need not go back to the past in order to find examples of mental contagions which are as injurious, directly, to the mind as they are injurious, indirectly, to the body. Those strange phenomena of movements of the limbs which are excited, in susceptible

children, from imitation, are of this class; and the still stranger phenomena of hallucination and spiritualistic manifestations are of the same contagious order, and are so contagious that whole masses of people may from one case, itself suddenly developed, be affected by an epidemic visitation having its period of maximum intensity, and then, the epidemic influence withdrawn, sinking to a minimum, and for a time ceasing altogether. It is deserving of remark, before I bring to a close the present section of my discourse, that sometimes the physical and the mental forms of disease run together so intimately that it is difficult, even for the skilled observer, to distinguish between the one and the other. The fact here named is conspicuous during the existence of the outbreak of the alarming disease, Asiatic cholera. The intelligence of the phenomena of this malady poured into the impressionable mental organism, with all the tragedy of detail and circumstance of fear, is of such telling force that symptoms of the fatal disease may be introduced by the senses, and implanted with so strong an imitation as to make the distinction between the imitative and the actual disease a puzzle even to the practised observer.

MENTAL SHOCK.

The mental health of man is much affected by mental strain or shock. In this respect man stands alone in the world of life, separated from the lower families by his higher mental organization. The difference is one which is not altogether in his favor, and which is very distinctive in respect to him. He shares with the animal world generally in regard to the influence of the animal appetites on his physical nature. He shares with many of the higher classes of animals in regard to the influence of fear, rage, jealousy, and those faculties which we call the passions. But he is subject to other influences which come all but exclusively to himself, which come to him through his mind, and which are felt through his peculiar moral, intellectual, and habit-forming characteristics. More than this, he possesses what other animals do not possess: a special gift of foreknowledge, which causes him to be affected by the anticipation of what is to happen, or what may happen, which anticipation may be to him as severe as the actual occurrence

of that which is anticipated. From this cause man is subject to what is called mental shock, and, as a consequence, to a whole train of disturbances of mind, extending often into the body, which in the most learned works treating on the affections of the lower animals are unrecorded, and which, even in learned works treating on man himself, are recorded with too little respect. To observe that a human being has fallen into disease from the effects of a wound, a stun, or loss of blood, is common enough Volumes are written on such events and their after effects ; but to consider the mode of injury by an influence that shall penetrate by the senses or windows of the mind, that were too refined and indefinite a task. Yet this effect of shock on the mental constitution, one of the most potent of all influences on man, mentally and physically, becomes an influence which increases day by day with the increasing intelligence of the race. An uncultivated, all but animal human family, possessing the appetites as its leading pleasures, and having few other qualities higher than emotions resting on the appetites, may be so near to the animal world that few other beyond the grosser physical agencies affect it. But in a higher development and civilization these positions of mind and body are so extremely modified that impressions telling through the mind become rapid, powerful, and persistent, until, at last, they may be predominant. The mind begins to rule ; the body, now more subservient to the mind, grows up more susceptible to mental pressures, and the diseases developed in it, partaking of its own susceptibilities, are brought out more decisively by and through the mental impressions it receives. So on civilized man the effect of sudden shock is of serious import. The rougher natures, even of this day, laugh and jeer at the refined natures which are affected by what to them of ruder nature seems to be comparatively gentle perturbations. Between the highest and lowest civilizations there is thus a wide gulf, which is historical in its meaning, and which will remain historical until all the world is equally civilized, if such an event can ever be. Also, until such an event, remote as ages, is reached, the health of the mind, as influenced by shock, will be a topic for very careful sanitary study and lesson—a study increasing as civilization increases, with this fact always to the fore : that excessive

shock and strain might become so effective in action as to destroy the perfect mental balance of a whole people, and leave it naked to its enemies. For the influence of mental shock in susceptible subjects has this momentous fact about it : that it tells on every age of life, from the first completion of a nervous organization to the final ending of it. It may become subdued in the latest stages of life, when the senses are getting dulled, and the mind is becoming *sans* everything ; but in all preceding periods and stages it is in action. I recall at this moment a youth whose mental health is so disturbed by one particular series of vibrations acting on his mental organism, that though to other persons such vibrations are quite bearable, when they occur to him he is not himself. Yet the shock that implanted this perturbation on his mind was inflicted on him through his mother before he was born into the world. Nay, the shock may even go further back than that ; it may be traced back for three or four generations. A person, strangely and terribly affected, was brought to me, suffering with an intense susceptibility to one particular impression, which, to ordinary minds, is of no consequence whatever. To this person, this impression, whenever it came, was a bar to all mental health, and, by the effects secondarily induced, was a bar also to physical health. This phenomenal variation from health was not, I felt sure, a passing fancy or vapor, but was the recurrence of an ingrafted hereditary susceptibility to that one impression ; an ingraft occurring originally under circumstances which were peculiar and, perchance, terrible in their nature. At first nothing could be remembered that would either negative or confirm the theory suggested. But a careful inquiry, passing through three generations, established the truth of the theory beyond doubt. These phenomena, looked into, would be found to be of constant recurrence, and would account for many human conducts and events which now pass current as mysteries unfathomable. They are the mental echoes of the physical dead ; old vibrations played on a new instrument. They account for those ideals of pre-existence which almost every one experiences, and which, to persons gifted with the faculty of memory in an extreme degree, are often positive annoyances at times when affairs of current every-day moment are calling for earnest attention. These

effects of mental shock on the mind in causing permanent bad health of mind are most easily inflicted in the period of infancy and early life, school life ; of which let one illustration suffice. A gentleman who for many years was under my observation as a confirmed mental invalid, a strong man in most respects, but utterly irresolute, and in the end of disordered mind altogether, acquired his mental disease from sudden distrust. He had, in his childhood, an innate dread of deep water, and he had, at the same time, a tutor, for whom he held the warmest affection, coupled with the most absolute trust and confidence. In a thoughtless and unhappy moment, this tutor became possessed with the idea that he would break his pupil's dread of deep water by pitching him into a pool where they were accustomed to bathe together, at the deepest part. There was no actual danger, for the depth was really not great, the pool was calm, the boy could swim a little, and in an instant the tutor, a strong and skilful swimmer, was in the water himself, rendering succor and support. The lad was brought to shore safely enough, but the mischief to the mind was inflicted beyond repair. The surface of trust was obliterated beyond, and a fixed distrust in the mind of the youth was set up forever. If a skilful physiologist could have discovered the seat of trust in that youth, and could have destroyed it mechanically, he could not have inflicted a more severe injury, nor one more determinedly lifelong in its effects.

PERVERTED APTITUDES.

It falls to every mind to be influenced by its surroundings, to be affected by mental contagions, to be subjected to shocks and sudden strain, and to be affected in its health by all these influences ; and now I proceed to notice that there are other modes by which the mental health is affected, modes determined by what may well be considered as perversions and diversions from the particular aptitude for particular work of the mind. At the present period of time no subject of study whatever could be more important to us as a nation than this subject. To understand these perversions and diversions from the natural mental aptitudes it is necessary to know the mental constitution as it is divisible into its major parts : the appetites, including the passions ; the emotions, including the

sentiments ; and the reason, including the intellectual faculties ; judgment, or the weighing of evidence ; knowledge, or the accumulation of observed facts and wisdom, or the balanced application of knowledge of all and various kinds. These are the three mental primaries constituting the three lives of men : the animal life, the emotional life, and the intellectual life. In every man these mental lives exist, but in different degrees and in different combinations. In one the animal nature so prevails that he passes as animal ; another is all emotion ; a third is cold, thoughtful, hard. The members of the marked animal type are not, as a rule, of long endurance, but while they live they go through everything—through pain, through physical work, and even through drink and Bohemian fury with exceptional facility. To intellectual eminence and distinction they never rise by pure mental capacity, but they are often rendered famous by deeds of strength or animal skill, while now and then, by some *jeu d'esprit*, they gain an admiring auditory, and secure a large following of men after their own heart. The members of the emotional type are also not of long endurance, but, keen, over earnest, and led by impulses which appeal at once to natures like their own, they light up conflagrations of controversy. As men they constantly lead with them hosts of the gentler sex, by whom they are much admired ; and not infrequently they win, for a time, those successes which to colder intellects are mere passing victories, to be forgotten before they are fully realized. The members of the pure intellectual type are enduring though rarely great men. Work does not injure them either by its penalties or its pleasures ; they are not rough, for they have no animal rudeness ; they are not sympathetic, for they are deficient in emotional surface ; but they reason well, and, judging of men and things calmly, wait for the progress of events, bring into play what powers they have with precision, at the proper season, and—caring little whether they gain or lose, for all things are alike to them—remain simply as wise men. I sketch out here the primitive types of men as they exist now, and as they have existed ever since the first descriptions of men that can be gathered from reliable history. But there are combinations of these as there are changes of peals of bells. There are those who are of animal and emotional

combination; not a desirable combination. There are they who are of animal and intellectual combination, men of tremendous power, who can fell a tree or govern a nation with equal facility, men whose animal faculties quicken and feed their intellectual, and in whom the opposites of their nature act as foils the one to the other. There are others of emotional and intellectual combination, men bright and good by nature, who lend themselves to everything that makes life pleasant, who are both courted and trusted, who sympathize and philosophize; men whom every one who has the chance will invite to dinner; whom the societies and academies run after pell-mell; whom the philanthropists lie in wait for; who are the *dilettanti* of literature, art, and science; and who are splendid patrons, whatever else they may be. And, once more, there are the men of equally balanced combination, who, creating no enthusiasm, are looked upon with equal respect by friends and opponents; men whom every one would like to have as referee in cases of dispute, or as trustee at the crisis of making a will under urgent pressure. In drawing out these pictures of mental surfaces, I have followed Othello's advice; I have extenuated nothing nor set down aught in malice; my object being solely to indicate that among these different minds the health must needs be influenced by the external vibrations which keep the mind going, in a form and manner peculiar to each, as a mind in each case working by its own mould, by its own anatomy, under every impression from without to which it is subjected; differently in different persons even from the same impression; sometimes evenly, sometimes vehemently, and sometimes like sweet bells jangled out of tune and harsh. Let us think for a moment of the almost necessary results of ignorance on this truly vital theme. A man of a hard intellectual type sets up for a whole family of learning children a standard of learning like that which he himself approves, and sets up what he expects all other minds to conform to. As a result the tenderest faculties of the children —faculties, perchance, which, if they are to be utilized at all, would require to be brought out in the gentlest manner—are literally obliterated. The mind of the child is as clay in the hand of the potter. Yes? But the skilful master, he who turns out the finest work, is he who knows his clay, knows his

mould, and knows where lightly and where firmly to touch, and shape, and shear. Later on in life, when youth is being sent forth on its destined career, this same error bearing on the health of the mind is perpetrated with as grievous carelessness as ever. Comparatively few youths would, I think, go wrong in the careers in which they are sent forth if their mental facility for that which they are expected to perform were correctly gauged. A man who is color-blind is, by necessity, prohibited from taking charge of railway signals ; yet over and over again we see youths whose emotional natures are quite as strong a bar to some calling or profession—such a profession as mine, for instance—forced into the selected profession, to endure a martyrdom for life, with not one moment of chance for distinction, or for anything more than the qualified performance of duties which are a daily cross and a daily sorrow. Such men take sometimes to what are called bad courses, become intemperate and forfeit confidence ; toward whom let pardon have a fair place, since the primary error is not their own. These mistakes which mature men and women inflict on the young are bad, but they are not worse than mistakes which the mature often inflict on their own maturity. Men knowing nothing of their own mental constitution, and thinking nothing of their own mental health, throw themselves into mental strifes and contentions for which they are as little mentally fitted as they are physically fitted to remove mountains. This man, with his animal life worn out by professional or business labors, determines to close his honorable career by undertaking senatorial duties which call for mental animal work of giant power. Another, whose emotional mind—always the master of his intellectual part—has led him constantly into serious scrapes and difficulties, permits himself to enter into contests in which the whole argument turns on sentiment, and breaks himself to pieces in the struggle. The subject here is so fruitful of suggestion and of illustration, I fear to follow it further, lest I be forced thereby to leave out some other matters bearing on the health of the mind which could not properly be left untouched. Suffice it now, therefore, to say that the study of mental aptitudes becomes a part of the study of every sanitary scholar. To the man who is a sanitarian it is of first rank ; to the woman who would make good health the

choicest garment of good life, it is beyond compare, because in the early days of life the diagnosis of the human mind is so distinctly her task. The man, the father, brings the food, the clay; the woman, the mother, sees how the clay is moulded, and moulds it anew.

MENTAL OVERCHARGE.

If too sudden and extreme an impression be made on the mind, there is commonly a start or a convulsive movement. That is overcharge, the surplus of vibration cast from the mental into the muscular organization. The motion which looks so alarming is the relief. If there were not that means of relief the vessels of the brain might break, or the heart itself might burst. Sometimes when these parts are weakened they do give way, under shock, and "stroke" or "syncope" brings the life to a close. These are the major overcharges of the mind declared visibly through the body. But, short of these, the health of the mind is too often affected by the effect of minor overcharge, arising, not from sudden vehement shocks, but from little shocks leading to long-continued pressures, which kill the mind in parts or centres or altogether. By this latter process of overcharge the health of the mind is injured in our day to an extent that probably has never before been reached in our national history. Our schools at this moment are engines of unprecedented power and skill for effecting mental overcharge and all its accompanying evils. Our modes of life in periods of later life, our pressures of business, our struggles for wealth and notoriety, with health and true fame both at a discount, our flying visits hither and thither over the whole surface of the earth without exploring it, our cravings for mental stimulations of every kind and quality, our resolute desire to try once more to scale heaven that we may tear aside the veil that conceals the infinite—these overcharges of mind are momentous in the present crisis of the civilized world. If some of the grosser appetites are reduced, the emotions are more wildly aflame and the reason more at bay. The passions are rising in mighty waves, and the brain is becoming like a troubled sea. Love staggers before hate, jealously outrides fear, and assurance in equality of mind is so strongly assertive that at the rate we are now

going no man will have a chance erelong of being remembered for what he has achieved, save the man who has stunned the world with the record of the most hideous possible crime. Yet, with it all, there is the gleam of hope that, with knowledge so advanced as it is, there will be developed a more reasonable desire to temper knowledge with wisdom, and to bring the passions, now so wild and furious, into subjection to reason. It is toward methods of teaching that shall lead in the direction of reform in all conditions which affect the health of the mind, that the study of the mind becomes now a part of the duty of the true sanitary scholar. For let me observe that to neglect the mind is also to neglect the body itself. There has been no opportunity in this address to refer to the injuries of a physical kind which follow in the body from mental insalubrity. Under our sanitary skill great plagues are being swept away, and by that sweeping our death-rates are coming down to a figure that is a marvel to the world at large. "Ah!" says the enthusiast, "see you the prophecy is at hand, there shall no more be an infant of days nor an old man that has not filled his days;" for note how the young are ceasing to die, and how the old are continuing to live. It is true, and yet the millennium is not in sight. "For observe," say those of us who are on the watch-towers, "observe how diseases of nervous origin—in other words, of mental origin, diseases like diabetes and cancer, and some forms of insanity, are on the increase! Observe, too, how the social storms, always so mortal when they set in, are showing their premonitory signs in every quarter. There is less death; there is more life. Is there less disease of the mind as well as of the body?" That is the question.

HASTINGS-ST. LEONARDS-ON-THE-SEA.

And where shall the question be best tried? What is the proper time, what the proper place for putting it to the test? What time better than the present, when health is a popular theme; what place so good as that in which health is most advanced, some place famous for health and its resources? Adapting the argument to the present time and place, when and where could the work begin more appropriately than now and here? We meet for the encouragement of health; we

meet to consider and discuss the greatest subjects connected with that absorbing subject ; we meet to listen to papers and debates by learned, earnest, and practical men ; and we have erected and furnished a beautiful exhibition building as the outward and visible sign of the practice as well as the spirit of our endeavors. Could we have a more fitting starting time or point ? Is it possible to find one more excellent ? Let, then, Hastings-St. Leonards-on-the-Sea—for it is now one place, and will, I trust, from this date have one name—let Hastings-St. Leonards-on-the-Sea, already so famous as an abode and centre of health, hold and keep the lead, not only in the matter of bodily, but of mental salubrity. Suppose Hastings-St. Leonards chose to continue in that course, and that we could see her in a hundred years to come in all her acquired strength, and purity and beauty ? The transformation would even be greater than the present from that town of one hundred years ago which Mr. Cole, in his excellent little work written for this Congress, tells us Dr. Matthew Baillie discovered as the site of a resort for those who required for health not merely the open breezes of the sea, but beauty of scenery, and a climate so adaptable to season, that different climates are included in one locality. In that transformation we should see a town of exquisite beauty, open in every part, and pure as the breezes from the surface of its ocean. Physically, all would be beautiful, the simplest, poorest home, the home of cleanliness and good taste and good bodily health. And mentally, how marked would be the change ! Every one of those fine and noble arts which, in their best form, exalt a nation, would be of the truest and healthiest. What we now call chaste and good, how much more refined it would be ! A drama, in which the history of the world, past and present, would be represented in such form that to every child it would be a school of mental health ; academies of painting and sculpture equally instructive and equally clear ; academies for ordinary teaching, in which learning and happiness properly combined would save the young from all the hazardous and shameless shocks of competition and cram which are at this moment so great a peril, shame, and disgrace ; amusements which would bring out both bodily and mental powers, and in which members of both sexes could alike take part with like

benefit ; and a literature so chastened, however powerful it might be, that the author who dared to present a work less spotless than the surface on which his thoughts and words were impressed would not be permitted entrance into the school, the house, or the library. This, with much more of mental and physical health, is what Hastings-St. Leonards may, and I believe will become, as time wears on, as the thoughts of men widen, and the value of health increases in estimation. But whether the grand progress be greatest in this place or in some other, it is our duty to be the heralds of it, and do our best, our utmost best, to add to days of life—

> "The richest bounties of indulgent Heaven,
> Truth, goodness, honor, harmony, and love."

THE TRUE WAY TO "MAKE COFFEE."—Dr. W. Junker, the African traveller, makes the following remarks on making coffee in his recent work, "Reisen in Afrika" (Wien and Olmütz, 1889, p. 208):

"Any European who believed that the decoction of coffee-beans which he had tasted at home deserved the name of 'coffee,' is soon convinced of his error after sojourning for a while in Turkey, Egypt, or Arabia. He will, indeed, at first be somewhat surprised always to find some sediment in his cup, which he is apt to overlook until he has swallowed some. But he will soon learn to sip the aromatic liquid carefully from off the sediment. . . . The proper way to prepare coffee is as follows: The beans, which should, of course, if possible, be of the very best quality (genuine Mokka), are carefully examined, and all damaged ones picked out, constituting then what is known as *el-búnn es-ssafî*. Immediately before use, the requisite quantity is freshly roasted and powdered, which latter is preferably done in a wooden mortar. The powder should be quite fine, like flour. Water having been brought to a boil in a suitable kettle or vessel, a certain quantity of the powder—a small spoonful for every small cupful of coffee to be drawn from the vessel—is added, the whole stirred, and the vessel replaced on the fire until the liquid boils and foams up. It is then removed, and the coffee served."

THE DEATH-RATE AND INTOXICATING LIQUORS.

CONSIDERABLE discussion has taken place the past year in regard to a document published by the British Medical Association relating to the alcoholic habits and death-rate of different occupations and classes. The liquor press has taken up portions of it, and made an effort to show that the death-rate of drinkers was not greater than abstainers. They omit to notice the following, which will be found among the deductions of the Committee of the Association :

"On the whole, then, in addition to the information which we obtained from these returns as to the alcoholic habits of the inhabitants of this country, and as to the relative alcoholic habits of different occupations and classes, we may not unfairly claim to have placed upon a basis of fact the following conclusions :

"1. That habitual indulgence in alcoholic liquors beyond the most moderate amount has *a distinct tendency to shorten life, the average shortening being roughly proportioned to the degree of indulgence.*

"2. *That of men who have passed the age of twenty-five, the strictly temperate, on the average, live at least ten years longer than those who become decidedly intemperate.* We have not, in these returns, the means of coming to any conclusion as to the relative duration of life of total abstainers and habitually temperate drinkers of alcoholic liquors."

Life insurance statistics, as summed up by the *National Temperance Advocate*, show the great benefit of total abstinence.

The returns of the United Kingdom Temperance and General Provident Institution of London prove conclusively the remarkably greater length of life among abstainers than among drinkers who are not drunkards. The statistics are spread over twenty-two years, and afford the best proof attainable of the marked longevity of abstainers, as compared with drinkers. Drunkards being excluded altogether, the averages for the whole period in the Temperance Section were: Expected

deaths, 3937; actual deaths, 2798. In the General Section: Expected deaths, 6144; actual deaths, 5984. By which it is observable that, in the General Section, including moderate drinkers, in the twenty-two years, there were only 160 less "actual" than "expected" deaths; in the Temperance Section, exclusively of total abstainers, there were 1139 less "actual" than "expected" deaths in little more than half the number of policies.

These figures represent facts of great significance for the consideration of the individual citizen as to his personal well being, and for the statesman and legislator charged with the duty of legislating for the promotion of the general public welfare.

The experience of the Rechabites of Great Britain, as compared with the Odd Fellows and Foresters, is 1 death in 44 yearly for drinkers and 1 in 140 for Rechabites.

A WORD AS TO WINE.—Now wine may be defined as the fermented juice of the grape, containing no added matter, with the exception of alcohol, and the alcohol must not raise the strength of the wine beyond 13 per cent by weight or 28.1 per cent of proof spirit. The addition of spirit to the extent given above may be purely for the preservation of the wine; any excess of that quantity is a noxious adulteration. Dr. Thudichum tells us that "much turbid and putrid, evil-smelling wine is treated at Jerez with animal charcoal. Putrid and evil smells can be removed by charcoal, but the clearing such wines is only a temporary success. Much wine is fined with blood, which is put warm into the bota. The albumen precipitated by the alcohol causes the turbidity to be enveloped, and drags it to the ground. Jullien's powder consists of dried blood, and is not really putrid. Meat is also used for fining wines; slices of steak are merely hung up in the wine, and their albumen is extracted, causing a precipitate. Most commonly albumen from eggs is used for fining the brandied wines."

As a matter of fact, wine is usually fined by means of isinglass; but in *natural* wine a clear liquid may always be produced by bottling, a crust being deposited. In Eastern countries,

where the primitive manufacture of wine is still carried on as in the days of Noah, the crushed grapes are merely poured into jars and allowed to ferment, the crushed fruit—or murk—being violently agitated three times a day by means of the hand or a wooden plunger. If a dry wine is required, the husks and stalks are left in ; if a fruity wine is needed, they are removed. The dry quality of wine is, therefore, simply a question of the short or prolonged maceration of the husks and stalks of the grape in the fermenting wine ; the stones need not be taken into account, as, even after remaining in the wine many months, they are still unchanged. Natural wine thus produced needs no fining. After fermentation has ceased the contents of the jars are run through a coarse filter, and the result, a fluid of the consistence of thin pea-soup, is placed in carboys, and in about three months' time can be drawn off in a perfectly clear condition, all sediment having been deposited. Such is, shortly, the mode of manufacture of the celebrated Shiraz wine, which much resembles a virgin sherry.—*The Saturday Review.*

"ALCOHOL," says Professor Atwater, in the *Century* for May, "like bread, is manufactured artificially from a natural product. In each case fermentation, a natural process, is made use of. But while bread is known only as a product of manufacture, alcohol appears to be very widely distributed in nature, though in extremely minute quantities. Nor is this at all surprising. If grapes or apples, or their juice, be exposed to the air, fermentation sets in and the sugar and other carbohydrates are changed to alcohol. The ferments which cause the change are afloat in the air all about, and might not unnaturally attack similar compounds in other vegetable substances.

"The moral argument against alcohol seems to me invincible. Is it not certainly strong enough when the facts are adhered to, without the exaggerations into which earnest reformers, in the intensity of their convictions, are sometimes led?"

COOKING AND HEATING BY GAS.*

By Joseph R. Thomas, C.E.

A short time ago General Hickenlooper, President of the Cincinnati Gas Company, brought prominently to the notice of the resident architects and builders the desirableness of placing in buildings, while in course of erection, not only all pipes and fittings, but also the appliances for utilizing illuminating gas as an agent for cooking and heating. Were the advice then given strictly followed out and the appliances placed as recommended, the result in the near future would be a large increase in gas sales in that city. The course pursued by the general in thus calling attention to this subject is not alone very commendable, but also might be profitably followed by the executives of all other gas companies.

The proper time for placing gas cooking and heating appliances would certainly seem to be when the building to contain them is progressing to completion; for it is obvious that by attending to that work at this time it cannot only be accomplished much more satisfactorily, but also at less cost than if the fitting-up is the result of an after-thought. Is it not plain that, when such appliances are not in the finished structure, and so have to be installed when the buildings are completed and possibly occupied, the insertion of the necessary piping is troublesome and annoying to the occupant? Under such conditions floors have to be taken up, casings, etc., removed, and tiled hearths frequently disturbed so that the necessary connections may be made and placed. The trouble and vexation so caused—partly real, although hardly as great as that anticipated—deter many from having their houses arranged for gas, who would, were it otherwise, or with the premises fitted properly at the outset, gladly avail themselves of the opportunity to use gaseous fuel.

Almost all of our modern houses are fitted with open fireplaces intended for grate fires, but the installation is usually arranged for the employment of any of the prime solid fuels—wood, anthracite, or bituminous coal. As it is well known, none of these commodities are very low in price, and the op-

* A paper read before the Society of Gas Lighting.

portunity is thus offered of competing with them successfully by means of gaseous fuel. What better way can be found to secure this result than by first bringing its many advantages prominently before the public, clinching the introduction by proving that it is not only advantageous but economical.

The annoyances that precede and follow the use of solid fuels are very pronounced, and the banishment of the vexation caused by their presence will more than compensate for any presumed apparent saving in expense to be realized from their employment. Dirt and ashes have to be removed, and although the operation be attended to as carefully as may be, it is impossible to complete it without generating a dust-cloud that later on spreads itself over the room and its furnishings, to the injury of both. This nuisance alone, of the many caused by solid fuels, is a serious one. Therefore, were the many advantages obtainable by the substitution of gaseous for other fuels properly and forcefully brought out, coal, wood, ashes, and all the discomforts in their train would soon be relegated to their proper domain.

If we consider carefully the merits of gaseous fuel, and the relative superiority it bears to other fuels, little argument is required to convince the most obdurate of its convenience. As to its advantages, of course the cleanliness attending its use is marked and patent, and then we have it always at hand and ready ; but one of its most valuable features, when devoted to heating purposes pure and simple, is that by it as much or as little heat can be maintained as may be required, while at the same time it is completely under control. The degree of heat and the rate of consumption can be effected by simply turning on or off the gas supply. On the other hand, when depending upon wood or coal for heating, dust and ashes are not the only things the housekeeper has to contend with. The fuel supply, having been stored, must be reconveyed from its storage place to wherever in the house it is needed ; and in doing this walls are frequently battered and damaged, carpets are more or less worn—especially on stairways—by constant tramping ; and where many fires are maintained, an additional expense for servants is entailed.

It appears to be a well-settled fact, from its having been so often brought unpleasantly to one's notice, that the furnaces

for heating our houses, whether they be of the *bon mot* design or other type of manufacture, have their ups and downs, and "go off into the dumps," very similar to those which occasionally take possession of the kitchen angels. At times like these, when the weather is cold, with the mercury seemingly struggling hard to slip out of the bottom of the thermometer bulb, when of course considerable heat is required for warmth and comfort, it is that the furnace takes on its dumpy mood. This may happen, as it often does, just when we are priding ourselves that everything about the furnace is working smoothly and nicely ; but a change comes over the spirit of our dreams, and we are abruptly admonished that the reverse is the case, and our felicitious dream of enjoying a genial heat from the glow of the furnace is rudely dispelled. On these occasions the furnace appears to doubt the purpose for which it was intended—that of furnishing heat to make the home comfortable—since it starts off on quite a different tack, and in fact operates more like a refrigerator than otherwise. Whether this peculiarity arises from "pure cussedness," as Artemus Ward used to observe, or to some inherent defect in its construction, would be hard to determine ; nevertheless, the fact remains as stated, as every one using furnaces can substantiate. Under the conditions stated, and at other times as well, when supplemental heat is required in our homes, those in possession of gas-heating appliances can cast all care and trouble aside. By the simple act of striking a match to light the gas, the household can in a very short time enjoy the genial heat thus easily procured.

Some of the prime advantages of using gas for fuel purposes are thus exemplified, and there are many others that might be instanced in connection with it ; but we think those mentioned are sufficient to convince the most skeptical. With this understanding, no further elaboration may be required in describing the merits of gaseous fuel.

The question, however, is frequently asked, "How will it compare in cost with the others?" The best answer to such query is to practically bring the matter down to dollars and cents. We will suppose a cold room in which heat is required, the means for raising the heat to be a gas grate, the maximum gas consumption of which is twenty cubic feet per hour.

Rating the cost of the gas at one dollar and fifty cents per thousand, the cost of the fuel per hour is just three cents ; and this, it must be remembered, is the expense for maintaining the gas supply at the maximum of the grate's gas capacity. As the room becomes heated the quantity being consumed can be lessened ; hence, during the actual time of heating, the probable actual cost will not exceed one or one and one half cents per hour.

When used for cooking purposes fifty cubic feet of gas will easily cook a dinner for fifteen or twenty people. At the price above named this will cost seven and one half cents. Twenty cubic feet of gas will as readily cook a dinner for six or eight persons, and the cost of the operation will be just three cents—in fact, we have known of a breakfast that was prepared for four people, the cost of the gas used being but a little in excess of two cents. It is obvious that cleanliness and convenience are assured by gaseous fuel ; and the figures of cost, as instanced above, either for cooking or heating, prove its economy. It is safe to assume were the gas that is now manufactured freely utilized for cooking purposes, its cost would not exceed one half that now paid for the solid fuels employed to a great extent to accomplish the same purpose.

Many honest and inquiring minds are now engaged in attempts to solve the problem of how to produce a cheap and efficient fuel gas, and much time and research are being devoted to the subject. To these students we would say, keep right on in your endeavor to produce a fuel gas that will prove satisfactory under all its conditions. Should you not be successful in obtaining all you are striving for, you will undoubtedly gather much knowledge and experience in the undertaking which will be valuable in the future ; but at the same time while you are doing this it will also be well to try in every manner to introduce as a cooking and heating agent the gas you are now manufacturing. It is a well-known fact that the fuel gases now enjoying the greatest share of favor will not compare in their heating properties with that supplied for illuminating purposes ; therefore it is more advisable to do all you can with what you now have until something of better quality be found that will supersede it for furnishing heat with greater economy.—*American Gas-Light Journal.*

THE ADVANTAGES AND DANGERS OF ELECTRICAL LIGHTING.

ABSTRACT OF A PAPER ON "ELECTRICAL DISTRIBUTION," READ BEFORE THE INTERNATIONAL CONGRESS OF MEDICAL JURISPRUDENCE, NEW YORK, JUNE 7TH, 1889.

By HAROLD P. BROWN, Esq., Electrical Engineer.

THE air will no longer be polluted with smoke, for one immense station, provided with triple or quadruple-expansion engines and furnaces, in which combustion is complete, will supply heat, light, power, and motion. The consequent addition to human health, comfort, and length of life by the banishment of dirt and noise will be enormous. Electrical disinfection and sewage purification are already in use, and since we can command immense volumes of electricity, it is not improbable that a better understanding of the laws of meteorology will enable us to at least partially control the weather, and thus avoid the evil effects of severe changes and extreme temperatures.

But to offset these advantages earth and air are filled with wires, many of which may be charged with swift and invisible death, which may overtake the most cautious in a myriad of unseen ways. If, then, the near future is to see a thousand electrical horse power distributed where now we have but one, it is clearly the physician's duty to point out the dangerous currents, and it remains for the lawyer to secure wise legislative action preventing the adoption of systems or apparatus which needlessly jeopardize human life or health. The list of deaths from electric lighting numbers, though incomplete, over two hundred in the past few years; yet it must be borne in mind that not one street in a hundred or one building in a thousand is as yet lighted by electricity, and more than half the house lighting now done is the work of the continuous current used at a pressure that cannot possibly prove fatal. Dangerous electrical systems are being rapidly installed in all parts of the country, and in the interests of

human life and health prompt action is imperatively demanded.

The only safe and proper course is to have a thorough examination made by unpurchasable medico-legal experts, and laws in accordance with their recommendations submitted and urged for passage. But it may be said that the laws already in force give the various boards of health full jurisdiction over any business, matter, or thing dangerous to life or detrimental to health. True; but while every other source of danger is manifest to one or more of the senses, electricity is silent, impalpable, odorless, invisible. A man in the lawful pursuit of business or pleasure may be flashed out of life or have his nervous system hopelessly shattered by a contact between a metal railing and a damp pavement simply because some electric lighting company chooses to use a dangerous current or neglects safeguards on account of their expense.

Special legislation, therefore, is needed to prevent these hidden dangers. Burying the wires is no protection unless you bury with them lights and motors. Chicago has never had overhead electric light wires, and yet at least six men have been killed in that city by electricity. The wires of the telephone, telegraph, messenger service, fire or burglar alarm, etc., while harmless in themselves either above or below the surface, may be made death dealing by the presence of a dangerous system of electric light or power. If corporations are permitted as at present to enmesh our cities with wires carrying death-dealing currents—currents which can escape and produce death through any known insulation—it will not be long before the public clamor will cause the adoption of laws hampering, if not destroying, all electrical industries.

During the past years a long series of careful experiments was made by the writer to determine the comparative danger to life of the various forms of electrical currents, the results of which were considered at the December meeting of the Medico-Legal Society. This work proved beyond question that the continuous current, which flows steadily in one direction, was in itself perfectly safe, at least up to a pressure of 1400 to 1500 volts; that devices suggested by the writer would make its use reasonably safe in light and power systems up to

3000 volts ; that an interrupted or pulsating current was dangerous, and that an alternating current, known by physicians as "Voltaic alternatives," whose impulses are rapidly reversed in direction, was deadly at a very low pressure.

These conclusions are verified by the death record, for out of eighty-five fatalities, the particulars of which I have been able to obtain, not one is due to the low tension continuous current, but eight to the high tension continuous, fifty-four to the pulsating, and twenty-three to the alternating. The latter has but recently come into extensive use, and its plants are supplied with new insulated wire. As this insulation deteriorates with age, and as the system is extended, its death list will be rapidly increased. The physiological effects of these currents upon nerves and muscles also bear out these conclusions, since it is well known that the continuous current from a galvanic battery causes no painful sensations at limited pressures. Interrupting the same current produces severe muscular shocks, while alternating it intensifies the pain. About fifty of the deaths from arc light apparatus were caused by the victim handling a circuit already grounded, while he at the same time touched a second ground.

THE ABSOLUTE SIGNS OF DEATH.—Dr. B. W. Richardson, in a paper read before the Medical Society of London (*Lancet*, December 15th, 1888), gives the following efficient practical details : 1. Apply the fillet to the wrist and examine the veins at the back of the hand. If life is not extinct, turgescence of these veins will soon be apparent. 2. Open a vein at the bend of the elbow and seek for stringy coagula ; if necessary, two or more veins. 3. Inject ammonia hypodermically—after which the absence of a red blotch under the skin will be strong evidence of death. 4. Examine by strong light for absence of red color from the transparent tissues. 5. If any doubt still remains, and rigor mortis has not developed, let the body be kept in a damp room at 84° F.; this will speedily bring about decomposition if the body is dead, and will favor recomposition or restoration if life is not extinct. This last test has the advantage that it can be carried out in cases where it is forbidden to touch the body.

LEGISLATIVE CONTROL OF DANGEROUS ELECTRICAL CURRENTS.

ABSTRACT OF A PAPER READ BEFORE THE INTERNATIONAL CONGRESS OF MEDICAL JURISPRUDENCE, NEW YORK, JUNE 7TH, 1889.

By J. MURRAY MITCHELL, Esq.

THE State, by replacing the hangman's noose with the greatest punishment which can be inflicted upon man for the worst of crimes he may commit, has officially recognized that currents of electricity can produce death instantaneously. It has been shown to us to-day what electrical currents may be dangerous, but it is not my province (dealing with the legal side of the issue) to enter into a discussion as to what currents may be dangerous, but to maintain that such currents as have been or may be proved to be dangerous, even where the best insulation has been employed, should not be tolerated in any place where it could cause unintentional death or injury to the individual.

The history of modern development, both scientifically and legally, shows the increasing desire of the people for protection to life, limb, and health, and the necessity for increasing care in this respect, owing to the vast increase in dangerous manufactures.

While there is every reason to guard against these dangers which I have enumerated, there is far more reason for the restriction of the use of dangerous electrical currents.

Electricity, however, may, for the purposes of this paper, be divided into two different classes, without regard to alternating or continuous currents—namely, currents which are harmless and currents which are deadly. In all the commercial purposes for which electricity is now used, when great danger may ensue, currents of such low intensity can be used that no one could be injured thereby.

The question, therefore, resolves itself to this: Shall we allow a dangerous electrical current to be used when a safe one can do the same work? The spirit of our law is certainly

against such a course. We should not restrict the uses of electricity within unnecessary limits. It is far too great a benefit to us to do this, but we should not allow it to commit unnecessary slaughter. The extent to which harmless currents can be used and the limit of safety can be readily ascertained. Once found, the limits should never be exceeded.

MAD DOGS.—"One or two recent accidents," says the *Saturday Review* of May 18th, "raise the question—How about Mad Dogs? Are they to be 'allowed their first bite,' or are muzzles to be much worn this summer? Dogs of very forlorn appearance and surly manner are roaming the street; these bite other dogs, and these carry the war into families. We cannot all be so strong and lucky as Dumas, and we do not want to be so unlucky, though strong, as another person of whom he tells a story. The two stories are so like that they suggest a mixture of memories; but neither is pleasant. M. Alexandre Dumas *père* had a hound called Mouton, an undemonstrative brute, which rooted up a favorite dahlia. M. Dumas had introduced this dog, like that of Kenneth in the *Talisman*, into a novel. As he sat and wrote he kept an eye on his paragraph (where the hound was performing the noblest acts) and with the other eye he watched Mouton's excavations of the dahlia. When the paragraph was done he gave the unsuspecting Mouton a kick behind, and his Mouton returned to him. With one hand he caught the dog by the throat, Mouton caught the other hand in his jaws, and there was a noble fight. At last Mouton gave in, and for three days M. Dumas, with his hand under a stream of cold water, waited to see if Mouton would 'take his meals regular.' For three days Mouton abstained, and it seemed ten to one that he was mad. But then he picked up his crumbs, and neither it was that died. In the other story the other man collared the other dog and was not bitten, but died of the nervous shock. We do not want to die either of nervous shocks or of hydrophobia, and therefore we ask, How about muzzles? Whether they do more harm than good is a question which might be argued either way, for a moderate remuneration. But, if they do any good, do not let us mind the outcries of the owners of dogs."

CONCERNING LIGHTNING RODS.

A correspondent of the *Insurance Monitor* says that the requirements for a good lightning rod are: 1st. Material and size. The best available metal, it being the best conductor, is copper; good, soft, wrought iron is about one seventh as good a conductor as a pure copper rod of the same weight per foot. And yet, a half-inch iron rod has conducting power sufficient for an ordinary house, say of twenty by fifty feet. But copper is the best, as I have said, not only because it is a better conductor, but also because it does not oxidize so rapidly and will therefore last longer, and because it is more pliable and can be bent and fastened to the building much easier. In no case can you make the rod too large, if it is properly erected and grounded.

2d. The joints. Care must be taken that the joints are perfect, for a film of dirt or rust in a joint adds largely to the resistance of the rods. And a good rod may be rendered almost worthless by bad connections at the joints.

3d. Don't try to insulate it, because: first, you cannot do it if you try; for electricity, which has just shown its power of overcoming resistance, by leaping from a cloud to the rod, hundreds of thousands of feet, through air, could hardly be restrained by a ridiculously small ring of glass, which is wet all over with the first dash of rain. And second, because you only weaken the fastening and render the rod more liable to be torn away by the wind, when you run it through those glass thimbles.

Nail the rod solid to the house. If it is in the form of a flat copper strip, so much the better. Nail it closely (with copper nails, to prevent chemical action and oxidation of the nails). Then paint it the color of the rest of the house, and it is out of sight and protected.

4th. Extent of rod. Remember that your effort is to interpose between the house and the atmosphere a conducting medium that will carry to the earth all accumulations of electricity. Recollect, also, that a rod will protect, when elevated

above the roof, a circle whose radius is the height of the rod above the building. It follows, then, that we must protect the house by a sufficient number of elevated points. Speaking generally, it will suffice if each gable has a point, say six or eight feet high, and each chimney the same, and all are strapped together by strips of copper nailed on the ridges of the roof. Connect this system to the eave troughs if they are of metal and go to the ground.

5th. Earth connections. And now, having put plain metal points on each rod—put no money into gold, platina, and other fancy points—a copper one well tinned to keep it bright is as good as any—having done all this, and done it well, carry the rod or rods down to the ground, and to *permanent moisture.* Otherwise they are worse than useless—absolutely dangerous. If there is a well near by, go to the bottom of that. If there are water or gas pipes in the house, scrape the pipe clean outside the house, wrap your copper strip tightly around it, and solder it on. If you have no well or pipes, dig down to permanent wet, not merely to a point that is damp in wet weather. Bury a plate of copper, say two feet by four, setting it on edge, to get moisture on both sides—and rivet and solder your strips to it. Then fill it with charcoal or coke on both sides, to retain moisture, and fill the holes. If you can run waste water from the house into the hole, to keep it damp, so much the better.

At a town on the Mississippi River, a few years ago, a large number of rods were tested, both new and old, and not one of them went to water. On inquiring it was found that the nearest water was over fifty feet below. All above was fine, sharp sand. Of course every building there struck by lightning was burned. In cases like this there is but one remedy. Drive iron tubes for water, making a driven well, and solder to the top of that, and the same tube that brings your water up will carry your lightning down.

INK AND RUST STAINS are removed easily by a solution containing ten parts each of tartaric acid, alum, and distilled water. The solution has the trade name "encrivoir."—*Pharm. Ztg.*, 1889, 7.

LONDON, ANCIENT AND MODERN, FROM A SANITARY POINT OF VIEW.

THE following is an abstract of a lecture delivered by Dr. G. V. Poore, at the Sanitary Institute, Parkes Museum, 74A Margaret Street, W., on Thursday, January 24th, Mr. R. Brudenell Carter, F.R.C.S., in the chair.

Dr. Poore began by reminding his hearers that the mere age of London was one of the reasons why it became unwholesome. Roman London was buried deeply among rubbish of all kinds, much of which was putrescible, and, therefore, a source of danger in the soil.

Ancient London was well placed and magnificently supplied with water, for in addition to the Thames there were many streams, such as Westbourne, Tybourne, the Fleet River, Walbrook, and Langbourne, which originally were sources of pure water. All these brooks, however, had become disgracefully fouled, and for very shame had been covered over. One great drawback to the site of London was the proximity of marshy land on every side except the northwest, and formerly from this cause malarial fever and dysentery were great causes of the high death-rate.

In mediæval London, and even down to the eighteenth century, the houses were not so closely packed as they are now. Reference to Aggas's map (time of Elizabeth) would show that there was a great deal of garden ground within the city, and on comparing this map with Newcourt's map (Charles II.) it was evident that just before the Plague and the Fire the crowding of houses had become very much greater than it was in the time of the Tudor monarchs, who discouraged building near or in London.

Parker's map (1720) would also show that after the Fire the houses were not so closely packed as in the days of the Stuarts, for in this map a surprising amount of garden ground is visible within the walls. At this time also Moorfields were not built upon, and remained as a playground and air space, as it had done for centuries previously. That mediæval London was

very unhealthy, a perfect fever den, there could be no doubt. The Black Death in 1349, and the Sweating Sickness two centuries later, were times of great mortality which struck the popular mind, but it was not till 1593, when bills of mortality were first introduced, that we began to have any certain knowledge of the amount or the kind of disease prevalent. There was reason to think, however, that in the eighteenth century (after the Fire and the great Plague) the deaths exceeded the births by about 600,000 in the hundred years.

The fatal diseases were mainly fevers—malarial-fever, small-pox, typhus, measles, and (latterly) whooping-cough. The causes of the enormous mortality of mediæval London were due: 1. To the marshy, undrained soil, fouled with refuse of every kind. 2. The filthy state of the unpaved city, and a perfect swinish condition of the houses of the lower orders. 3. The ill-nourished and drunken condition of the masses, among whom a taint of scurvy was very common. 4. The condition of superstition and brutality (as evidenced by the punishments and the pastimes), which made any measures of public health impracticable. 5. The management of epidemics was bad, with a total neglect to separate the sick from the sound; and, finally, the medical faculty were scarcely less ignorant and superstitious than their patients.

Turning to modern London, the lecturer said there had been a great and manifest improvement; but when we looked at the low figure which is called the London death-rate, several things must be taken into consideration— *e.g.*:

1. The London of the Registrar-General included large districts, such as Lewisham, Wandsworth, Fulham, etc., which, in great part, were scarcely urban in character; and these being occupied by well-to-do persons, lowered the average death-rate for the whole city.

2. London being a city in which wealthy people abounded, its death-rate must not, in fairness, be compared to a city packed with undiluted operatives.

3. The mobility of the population was so great that this fact must vitiate our statistics, and it was to be remembered that nothing quickened the departure of an individual from London more than ill health.

4. The age distribution in London was very abnormal. It

was largely recruited by selected adults from the country, and there was a great deficit in the extreme ages, among which (the very young and very old) the death-rate is always highest.

5. Again, the diminishing birth-rate (that for 1887 was 2.8 below the average of the previous ten years) very greatly diminished the death-rate in a city where 158 children out of every 1000 born die before they are one year old.

It was difficult to believe that Londoners were very robust, when more than twenty-five per cent of them had recourse to the public hospitals in the course of the year.

The cause of the diminished death-rate (which was very considerably reduced after every allowance had been made) was due :

1. To the increase of knowledge, not only among doctors, but among the people generally, for we must remember that "self-preservation is the first law of nature."

2. Vaccination, and the modern plan of treating infectious diseases by the prompt separation of the patients, had done a great deal ; the total absence of small-pox and typhus were mainly due to these causes.

3. The cheapness of food, clothing, and fuel had, of course, diminished the tendency to disease, and the ease with which fresh fruit and vegetables were to be got had abolished the taint of scurvy which was so fatal to our ancestors.

4. The water supply had been improved, and the intake of the water companies was now removed to a portion of the river less tainted with sewage than that formerly in use.

5. Although the system of sewage disposal was an undoubted evil, and had given us three or four epidemics of cholera, and was the foster-mother of typhoid, still it was probable that so far the balance for good was in its favor, because it had removed a good deal of filth from dwellings.

The outlook in the future was dashed by three considerations :

1. Our system of sewerage and water supply had increased overcrowding by enabling us to build houses of any height without inconvenience to the occupant, and without any curtilage whatever, and since all sanitarians recognized that overcrowding was the greatest of all sanitary evils, it was impossible to shut one's eyes to this danger.

2. There was an expensive and menacing "loose end" to our sanitation in the shape of 150,000,000 gallons of sewage pouring into the Thames every day. The only proper destination of organic refuse was the soil, and it was not possible to see the end of the gigantic blunder we had committed in throwing it into the water.

3. The rapid increase of population along the valley of the Thames, where sewage disposal is on the same lines as in London, must make us apprehensive for our water supply, because the various tricks played with sewage in the shape of precipitations, etc., were not probably of a kind to make the effluent a desirable or a wholesome beverage. If the evil effects of free trade are to be counteracted it will be by returning the refuse of our towns free of cost to the impoverished agriculturist. "If we go on as we are going," said the lecturer, in conclusion, "and if our brethren in the Colonies follow our bad example, as they appear to be doing, it will be a Chinaman rather than a visitor from New Zealand who will sit in contemplation on the ruins of London Bridge."—*Builders' Reporter and Engineering Times.*

THE NORMAL MAN.—Professor Huxley asserts that the proper weight of man is 154 pounds, made up as follows: Muscles and their appurtenances, 68 pounds; skeleton, 24 pounds; skin, 10½ pounds; fat, 28 pounds; brain, 3 pounds; thoracic viscera, 3½ pounds; abdominal viscera, 11 pounds; blood which would drain from the body, 7 pounds. The heart of such a man should beat 75 times a minute, and he should breathe 15 times a minute. In 24 hours, he should vitiate 1750 cubic feet of pure air to the extent of 1 per cent. A man, therefore, of the weight mentioned should have 800 cubic feet of well ventilated space. He would throw off, by the skin, 18 ounces of water, 300 grains of solid matter, and 300 grains of carbonic acid, every 24 hours; and his total loss, during that period, would be 6 pounds of water and a little more than 2 pounds of other matter.

THE DECLINE OF AMERICAN STAMINA.

OUR schools are developing children's minds; what are they doing for their bodies? Is there one boy in ten in our schools deep-chested, erect, well knit, and strong all over? Or one girl in twenty? Are there five boys in an average class of sixty in any of our public schools who can run half a mile, in even three minutes and a half, without being badly blown and looking as if they had been overdoing themselves?

We have left the training of our bodies, especially in our cities and towns, to haphazard, and just that result to be looked for from such gross neglect is seen everywhere. Even the country boy, with his open fields and ample sunlight, and more or less of the invigorating farm-work, simply calls into play the same muscles which several generations of ancestors had developed, and is weak in the other and unused parts. But with the city boy it goes much further than this. Instead of being strong in some muscles, they are often weak in about all of them, and, as a natural result, in their nervous and vital systems as well. Dr. E. M. Hartwell, of Johns Hopkins University, well says on this point:

"There is a condition of mind and body not infrequently seen nowadays in children and youth, especially among females, which is characterized by an irritable, easily overwrought, and unsteady nervous system, arrested muscular development, disordered digestion, and enfeebled powers of assimilation, which might well be called *cachexia scholastica*, since it is largely and sometimes directly brought about by ignorant and foolish parents and teachers, who force and cram and overwork the undeveloped brains of children, and at the same time, by neglecting or frowning upon their play and exercise, do their best to retard the growth and development which they ought to promote and regulate."

Is there not that in this which may well set every thoughtful parent and teacher considering whether there is not crying need of reform here?

* * * * * * * *

Now let Boston put Dr. Sargent on its School Board; New

York, Dr. White or Dr. Savage, of the Berkeley Lyceum, or the director of the gymnasium at West Point, with Professor Dowd to help him ; Brooklyn, Dr. Anderson, of the Adelphi Academy ; Philadelphia, Dr. White, of the University of Pennsylvania ; and Baltimore, Dr. Hartwell, of Johns Hopkins University. Of the annual appropriation for education give the children's bodies, not a third, and the mind the other two thirds, but give their bodies simply one tenth, and give these experienced and able men free scope to at once put their ideas in active practice, not in some one high or normal school alone, but in every public school in the city. There is no need of having all follow any one system. There are as many good methods of bodily training as there are kinds of food. If the studies stand in the way, lop off some of the less important ones —enough till of the five hours devoted to the education of our children each day their bodies shall have at least half an hour. For health is almost as important as a smattering of history, or even a fair knowledge of geography. In that half hour every scholar in the city can be readily given a good deal of vigorous yet never violent exercise for about every muscle of body or limb, and for the entire lungs, and can quickly be taught—a thing they now know practically nothing about—just what muscles any known exercise calls into play.

The work can be done at present right in the school-room, the windows being thrown open to let out the air which has already been breathed a number of times and let in the fresh pure article. The quickened circulation, the deep breathing, the buoyant, gay feeling which lively exercise always brings, will send them back to their books with brains cleared, nerves strengthened, and the whole mental and bodily machinery the better for this brief unbending of the bow.

Let them study also the best elementary work on hygiene. But if there is only time for one of the two, get the exercise and let the books go. Then so arrange the afternoon, as they do at Harvard, that the hours from four to six are left wide open for exercise. Get the parents to see to it that no piano practice or anything else shall interfere with these afternoon hours of play. If it is the skating time of year, and the ice is good, teach them what skating does, what parts it calls into play, and what it does not. If it is the rowing time, what

rowing does ; and so of swimming and tennis, canoeing and foot-ball, and all the popular sports, each in its season—knowledge, by the way, that they will acquire in one lesson, and with avidity. Show them how much work is enough, and what will overdo. Urge the thin-legged to devote much of their two hours to foot-work, of which there is such a pleasant variety, and the narrow-chested to arm and shoulder work.

Especially impress it on the weak, the poorly built, and the over-studious, who are not good at any sport, that they are going to make very one-sided men and women, if they live that long, and get them out-of-doors in all weathers to lay in a store of vigor and stamina, so necessary to all who hope to ever accomplish anything in life.

If there are not fit skating-places and playgrounds and other facilities yet, see what is the best that can be done in the locality to get them, and have that done. And in the other cities and in the towns and villages the teachers themselves can easily find out most or all that these experts are doing in the large cities, and substantially copy it. If they do not know how to, and are not prompt to learn, put in their places teachers who do know how ; for once it is known that the authorities require this qualification in a teacher—and really a qualification very easily acquired—it will come, and come quickly.—*William Blaikie, in Harper's Magazine for July.*

TOBACCO SMOKING, Dr. A. G. Auld of Glasgow thinks, is responsible for a variety of functional derangements which there is no reason to aver cannot terminate in organic disease.

He is convinced that the slightest trace of albumen in the urine is pathological, and that it is frequently induced by preventable causes, and one of these is chronic poisoning by nicotine. He thinks he has certainly traced the disorder in a few cases entirely, and in others partially, to the habit in question.

Another derangement consists in localized fibrillary twitchings, something similar to what is observed in progressive muscular atrophy, and perfectly distinct from tremor. The twitchings are often excessive, and occur most frequently about the trunk and upper arms.—*Lancet, April 20th,* 1889.

PREVENTION OF CONSUMPTION.

ACTION OF THE HEALTH DEPARTMENT OF THE CITY OF NEW YORK.

DRS. HERMANN H. BIGGS, J. M. PRUDDEN and HENRY P. LOOMIS, Pathologists of the Board of Health of New York, who were requested to formulate a brief and comprehensive statement regarding the nature and prevention of tuberculosis, have made their report as follows :

The disease known as tuberculosis, and when effecting the lungs, as pulmonary tuberculosis (consumption) is very common in the human being and in certain of the domestic animals, especially cattle. About one quarter of all the deaths occurring in the human being during adult life, is caused by it, and nearly one half of the entire population at some time in life acquires it. The disease is the same in nature, in animals and in man, and has the same cause.

It has been proven beyond a doubt that a living germ called the "tubercle bacillus" is the cause and the only cause of tuberculosis. Tuberculosis may affect any organ of the body, but most frequently first involves the lungs. When the living germs find their way into the body they multiply there, if favorable conditions for their growth exist ; and produce small new growths or nodules (tubercles), which tend to soften. The discharges from the softened tuberculosis, containing the living germs, are thrown off from the body. In pulmonary tubercles the discharges constitute, in part, the expectoration. The germs thus thrown off do not grow, outside the living human or animal body, except under artificial conditions, although they may retain their vitality and virulence for long periods of time, even when thoroughly dried. As tuberculosis can only result from the action of these germs, it follows from what has just been said that when the disease is acquired it must result from receiving into the body the living germs that have come from some other human being or animal affected with the disease. It has been abundantly established that the disease may be transmitted by meat or milk from the

tubercular animal. The milk glands in the milk cows often become affected with the disease when their lungs are involved, and the milk from such animals may contain the living germs, and is capable of producing the disease. Among stall-fed dairy cows twenty or thirty per cent are sometimes found to be affected with the disease. Tubercular animals are also frequently killed for food. Their flesh sometimes contains the germs, and if not thoroughly cooked is capable of transmitting the disease. Boiling the milk and thoroughly cooking the meat destroys the germs. Although the meat and milk from tubercular animals constitute actual and important sources of danger, the disease is acquired, as a rule, through the communication from man to man.

Tuberculosis is commonly produced in the lungs (which are the organs most frequently affected) by breathing air in which the living germs are suspended as dust. The material which is coughed up, sometimes in large quantities, by persons suffering from consumption, contains these germs, often in enormous numbers. This material, when expectorated, frequently lodges in places where it afterward dries, as on the streets, floors, carpets, clothing, handkerchiefs, etc. After drying, in one way or another, it is very apt to become pulverized and float in the air as dust.

It has been shown experimentally that dust collected from the most varied points, in hospital wards, asylums, prisons, private houses, etc., where consumptive patients are present, is capable of producing tuberculosis in animals when used for their inoculation. Such dust may retain for weeks its power of producing the disease. On the other hand, dust collected from rooms in institutions or houses that have not been occupied by tubercular patients, does not produce the disease when used for the inoculation of animals.

These observations show that where there are cases of pulmonary tuberculosis under ordinary conditions, the dust surrounding them often contains the "tubercle bacilli," and persons inhaling the air in which this dust is suspended may be taking in the living germs. It should, however, be distinctly understood that the moist sputum received in proper cups are not elements of danger, but only the dried and pulverized sputum. The breath and moist sputum are free from

danger, because the germs are not dislodged from moist surfaces by currents of air. If all discharges were destroyed at the time of exit from the body, the greatest danger of communication from man to man would be removed.

It then follows that tuberculosis is a distinctly preventable disease. It is a well-known fact that some persons, and especially the members of certain families, are particularly liable to tuberculosis, and this liability can be transmitted from parents to children. So marked and so frequent is this liability, and so frequent is the development of the disease in particular families, that the affection has long been considered hereditary. We now know that tuberculosis can only be caused by the entrance of the germ into the body, and that this transmitted liability simply renders the individual a more easy prey to the living germs, when once they have gained entrance.

The frequent occurrence of several cases of pulmonary tuberculosis in a family, is then to be explained, not on the supposition that the disease itself has been inherited, but that it has been produced after birth by transmission directly from some affected individual. When the parents are affected with tuberculosis the children from the earliest moments of life are exposed to the disease under the most favorable conditions for its transmission, for not only is the dust of the house likely to contain the bacilli, but the relationship also between parents and children, especially between the mother and child, are of that close and intimate nature especially favorable for the transmission by direct contact.

If, then, tuberculosis is not inherited the question of prevention resolves itself principally into the avoidance of tubercular meat and milk and the destruction of the discharges, especially the sputum of tubercular individuals. As to the first means of communication, those measures of prevention alone answer the requirements which embrace the governmental inspection of dairy cows and of animals slaughtered for food, and the rigid exclusion and destruction of all those found to be tubercular.

For the removal of the second means of communication, *i.e.*, the sputum of tubercular individuals, the problem is simple when the patients are confined to their rooms or houses;

then wooden or pasteboard cups with covers should always be on hand for the reception of the sputum. These cups are supported in simple racks, and at least once daily, or more frequently if necessary, should be removed from the racks and thrown with their contents into the fire. (A cheap and efficient cup answering this purpose is now on the market, and is supplied by the druggists.)

The disposition of the expectoration of persons who are not confined to their rooms or houses is a far more difficult problem.

The expectoration certainly should not be discharged on the street, and the only practical means for its collection seems to be in the handkerchiefs, which, when soiled, should at the earliest possible moment be soaked in a solution of five per cent carbolic acid and then boiled or washed. Handkerchiefs thus soiled are exceedingly dangerous factors in distributing tubercle bacilli, for when the sputum becomes dry it is easily separated in flakes from the cloth, and then soon becomes pulverized and suspended as dust.

It becomes evident from what has been said that the means which will most certainly prevent the spread of this disease from one individual to another are those of scrupulous cleanliness regarding the sputum. These means lie largely within the power of the affected individual. It is furthermore to be remembered that consumption is not always, as was formerly supposed, a fatal disease, but it is in very many cases a distinctly curable affection. An individual who is well on the road to recovery may, if he does not with the greatest care destroy his sputum, diminish greatly his chances of recovery by self-inoculation.

While the greatest danger of the spread of this disease from the sick to the well is in private houses and in hospitals, yet, if this danger is thoroughly appreciated, it is for the most part quite under control, through the immediate destruction of the sputum and the enforcement of habits of cleanliness. But in places of public assembly, such as churches and theatres, particularly the latter, conditions are different and the safety would seem to depend largely upon a dilution and partial removal of the floating and possibly dangerous dust by means of adequate ventilation.

Rooms in private houses and hospital wards that are occupied by phthisical patients should from time to time be thoroughly cleaned and disinfected, and this should always be done after they are vacated, before they are again occupied by other individuals. Steamship companies should be obliged to furnish separate apartments for consumptive persons, so that no person in the exigencies of travel need be forced to share his room with one who might be a source of active danger to him.

We desire to especially emphasize the following facts :

1. That tuberculosis is a distinctly preventable disease.

2. That it is not directly inherited, and

3. That it is acquired by the direct transmission of the tubercle bacillus from the sick to the healthy, usually by means of the dried and pulverized sputum floating as dust in the air.

The measures, then, which are suggested for the prevention of the spread of tuberculosis are :

1. The security of the public against tubercular meat and milk, attained by a system of rigid official inspection of cattle.

2. The dissemination among the people of the knowledge that every tubercular person may be a source of actual danger to his associates, if the discharges from his lungs are not immediately destroyed or rendered harmless ; and

3. The careful disinfection of rooms and hospital walls that are occupied or have been by phthisical patients.

NEW YORK'S MORTALITY STATISTICS.—Dr. Roger S. Tracy, Registrar of Vital Statistics of the Health Department of New York, has recently presented a report decidedly controverting the belief that has for many years obtained with regard to the relative mortality of the occupants of tenement-houses. He states that

"Out of an estimated population of 1,526,081 in New York, 1,093,701 have been found to be living in tenement-houses, not including the first-class apartment houses and flats of the better kind. There were 40,175 deaths in the city in 1888, and 24,842 of these occurred in tenement-houses. The num-

ber of persons who lived in tenement-houses and died in hospitals and other public institutions during the year is not accurately known. The general death-rate per 1000 inhabitants was 26.33, while the death-rate among tenement dwellers was 22.71.

"In the district west of Broadway and south of Fourteenth Street the death-rate was 26.60, while in the district east of Broadway, which is the most densely populated part of the city and contains a tenement-house population almost exclusively, the death-rate was only 22.55. 'This,' Dr. Tracy writes, 'would seem to indicate that the population of the city has been underestimated and that the quoted death-rate is too high, or that all the deaths belonging to tenement-houses had not been credited to them, or else that the death-rate is actually lower for the tenement-house population than for the rest of the city.

"'In all the districts the death-rate of persons five years old and over, as a rule, decreases as the number of tenants increases, while the death-rate of children under five years of age increases up to a certain point, but when there are more than eighty tenants to a house the infant death-rate diminishes the larger the number. It will be noticed that the general death-rate is largest in houses containing from sixty to eighty tenants and that it is caused by the higher death-rate of children, which reaches 114.04 per 1000 living in those houses. The progressive decrease of the death-rate among persons five years old and upward may be accounted for in three ways: The larger houses are occupied by poorer people and a larger proportion of the sick go to hospitals, or that the houses contain a larger proportion of the age when the death-rate is lowest, or that the tenants of larger houses actually live under better sanitary conditions than those of the smaller ones.'

"Dr. Tracy sums up the results of his analysis as follows:

"1. The death-rate in tenement-houses is less than the general death-rate of the city.

"2. The death-rate in large tenement-houses is less than in smaller ones.

"3. While diarrhœal diseases and diphtheria show a greater death-rate in the larger houses, phthisis and pneumonia show

comparatively little difference. That difference, however, is in favor of the larger houses.

"4. The greatest general death-rate, the greatest death-rate among persons over five years of age, the next to the highest death-rate from diarrhœal diseases and pneumonia, and markedly the highest death-rate from phthisis, are in the district south of Fourteenth Street and west of Broadway. The excessive mortality in this district probably is connected with the greater number of old houses and the dampness of the soil."

The chief reason for this difference of mortality to the advantage of the tenement-houses is attributed to the exercise of the plenary power of the Board of Health in regard to them, in both construction and appointments during recent years, while the construction and appointments of the hitherto supposed to be the more healthful class of houses have been left to the intelligence of the architects and tenants, excepting a general compliance only with the plumbing laws. Dr. Tracy's report is well calculated to strengthen the Health Department in public confidence and to encourage it to the exercise of increased vigilance with regard to all classes of houses and people.

EMBALMING.—The best process of embalming is called the "Brunelli Process." The circulatory system is cleansed by washing with cold water till it issues quite clear from the body. This may occupy from two to five hours. Alcohol is injected so as to take out as much water as possible. This occupies about a quarter of an hour. Ether is then injected to abstract the fatty matter. This occupies from two to ten hours. A strong solution of tannin is then injected. This occupies for imbibition from two to ten hours. The body is then dried in a current of warm air passed over heated chloride of calcium. This may occupy from two to five hours. The body is then perfectly preserved and resists decay.—*Med. Bull.*

EDITOR'S TABLE.

☞ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, 113A Second Place, Brooklyn, N. Y.

Many subscriptions are now due, beginning with this volume; and some over due on previous volumes. Subscribers will please conform to conditions of detachable order on advertising page.

BROOKLYN'S DEPARTMENT OF HEALTH has recently rivalled that of New York in its unjustifiable manner of dealing with a case of yellow-fever, doubtful or otherwise, by its needless, and, to the patient, dangerous procedure; and, moreover, by arbitrarily imprisoning the physician who had attended the case and the family that harbored it.

The facts of the case, briefly stated, are: Dr. Duncan, medical officer of the steamship Colon, recently from Panama, arrived in Brooklyn about a month ago ill with fever. Dr. J. B. Bogart was called upon to attend him; but as he was not able to clearly diagnose the case, he did not feel called upon under the ordinance requiring physicians to report all *contagious* diseases to the Department of Health to so report this case, and so held it in abeyance for several days. Finally, while still doubtful as to its true nature, he reported it semi-officially, verbally expressing his suspicion that it was a case of yellow-fever, and on that account he would like to get rid of it lest he should endanger his other patients, in the event of its turning out to be what he suspected. Upon this an inspector of the Department of Health was sent to examine the case. Dr. Duncan is reported to have informed him, as he also had Dr. Bogart, that he had before had yellow-fever and that he was himself quite sure that his present illness was not it. The inspector appears to have agreed with Dr. Bogart with regard to the doubtful nature of the disease, but on the assumption that if it was yellow-fever its tolerance would be dangerous to the public, he concluded to give the public the benefit of the doubt and so pronounced it to be a case of yel-

low-fever. By direction of the Department of Health the patient was promptly sent to Swinburne Hospital in the Lower Bay ; Dr. Bogart was arrested and the house in which Dr. Duncan had been taken care of was quarantined and "disinfected."

That such a procedure should have greatly astonished the physicians of Brooklyn and created considerable public alarm, particularly in the neighborhood of the "infected" house is by no means surprising. While it is to be presumed that every physician who has the good of the community at heart appreciates the importance of supporting the health authorities in every measure protective of the public health, all the details of the action taken by the Health Department in this case are so inconsistent with a knowledge of the disease, proper regard for unnecessary public alarm, duty to the sick, and the rights of physicians, as to be wholly exceptional.

In the first place, physicians conversant with yellow-fever, or who are well read in the history of it, know it to be personally non-contagious ; that those ill with it require the utmost care and gentleness in their treatment ; that the simply raising a patient from a recumbent to a sitting position may be the means of bringing about a fatal issue ; that the disease rarely or never occurs a second time in the same individual, and that the sick with yellow-fever do not infect the surroundings. Such patients only require the same care with regard to the secretions as those who have typhoid or other fevers, and this care can always be exercised without danger to any one. But the effects of yellow-fever patients which have been exposed to *infected places* are liable to be infected, and should be burned or disinfected.

Moreover, there are a considerable number of physicians and many other intelligent persons still living in Brooklyn, who are familiar with these precepts as practised on former occasions. That such an act as quarantining a physician because he has been in attendance upon a patient with yellow-fever, or of a family who has had the care of any such patient, or the removal of any such patient supposed to be ill with yellow-fever to the Quarantine in the Lower Bay, or other harsh measures have never before been exercised by any one in authority or otherwise in this community. There have been

several examples of such harsh treatment of cases by the health authorities of New York, and all patients so treated have died. That Dr. Duncan is convalescent is additional evidence, inferentially, to that given by the Health Officer of the port that his disease was not yellow-fever.

LONG ISLAND CITY'S ANNUAL STENCH is now at its seasonable height, and for the time being attracts more attention in New York than the perennial stench arising from the sewage deposits between the rotten piers of the East River front. The State Board of Health has again determined, as it has every year since its organization in 1880, to abolish the nuisance. It is unfortunate for the city of New York that just as Dr. Moreau Morris's report to the Health Department on the abominable condition of the rotten bulkheads and the dangerous emanations from the sewage deposits between the piers all along the river front had just begun to enlist the attention of the Department, the odors from Newtown Creek should assert their pre-eminence. They are of a piece and both cumulative. And but for the singular fact implied in the resolution of the State Board adopted at a special meeting on the 3d inst., called for the purpose of taking action on the Newtown Creek nuisance, that the Board is yet ignorant of its powers in the premises, there would possibly be reasonable ground for hope that something would be done to abate it. As reported in the public prints, " Dr. Bryant settled matters by offering the following :

" *Whereas*, There being no local Board of Health in Long Island City, and

" *Whereas*, The nuisances located thereat are very offensive at times to the people of New York City and surrounding counties, be it therefore

" *Resolved*, That the Secretary of the State Board of Health be and is hereby directed to consult with the Attorney-General regarding the powers of the State Board in the matter of the Long Island City nuisance."

This action was preceded by the secretary's account of what had *not* been done under the annually declared intentions of the Board and the plenary power of the Governor in the premises. The process of inquiry adopted will probably last

till the heat of the summer is over, when the odors will be abated by cooler weather, as hitherto, and the elections coming off, all further action for this year will be postponed.

RICHMOND BOARD OF HEALTH, VA., is a good deal exercised over the project of a real estate enterprise to exhume and remove about three hundred small-pox dead, buried in 1882, at the risk of reviving an epidemic, and there is too much reason to fear that the City Council, accepting the passiveness of many physicians who take no interest in preventive medicine and who habitually ignore all such questions, as representative of knowledge on the subject, will permit the risk.

It would be well to remind the Council and the public of an incident, as related by Sir Spencer Wells before the Scottish Burial Reform and Cremation Society, Glasgow, last year, with regard to a disease considerably less intensely contagious than small-pox, briefly, as follows:

There was a remarkable instance in Yorkshire, where a number of scarlet-fever patients were buried in the churchyard. A part of that churchyard was closed, but was afterward included in the garden of the rector, who had it dug up, and the scarlet-fever from which those patients had died *thirty years before* broke out in the family of that clergyman and spread to the surrounding houses.

There are many instances in which other diseases have been incited and spread in the same way. And to knowingly and wilfully take, or officially permit to be taken, such a risk as that which threatens Richmond in this case, is hardly conceivable of an enlightened community.

A FILTHY SUMMER RESORT.—The *Rockaway Journal* of June 29th, publishes a communication from Dr. Charles L. Hogeboom with special reference to the necessity of filth disposal from that town, which may be read with profit by the authorities of many other summer resorts who in like manner practice filth storage seemingly for its death-dealing effects on those who visit them. Several feasible methods are suggested in the communication, any one of which, if adopted, would greatly promote the sanitary conditions and consequent prosperity of the place.

THE AMERICAN CLIMATOLOGICAL ASSOCIATION held its Sixth Annual Meeting in Boston, June 24th and June 25th, 1889. There was a good attendance of members. The papers read and discussed were as follows :

ADDRESS BY THE PRESIDENT, Dr. V. Y. BOWDITCH, of Boston : "Comparative Results in Ninety Cases of Pleurisy, with Special Reference to the Development of Phthisis Pulmonalis."

"A Study of the Summer Climate of the Massachusetts Coast." Dr. William D. Hodges, Boston.

"Reports of Cases of Acute Miliary Tuberculosis." Dr. John C. Munro, Boston.

"The Mortality of Acute Lobar Pneumonia : A Study of all the Cases Treated at the Massachusetts General Hospital, from the First Case in 1822 to the Present." Drs. C. W. Townshend and A. Coolidge, Jr., Boston.

"Consumption as I have Known It." Dr. E. P. Hurd, Newburyport.

"The Influence of Climate and Season upon Normal and Abnormal Manifestations of Nervous Activity." Dr. Walter Platt, Baltimore.

"The Basis of Rational Climato-Therapy." Dr. Griffith E. Abbott, Bryn Mawr, Pa.

"Ocean Therapy." Dr. Albert L. Gihon, Surgeon, U. S. N.

"The Vital Statistics of a Staid Population in an Ocean Atmosphere." Dr. A. N. Bell, New York.

"The Psychological Factor in Selecting a Climate for Invalids." Dr. E. O. Otis, Boston.

"The Wakefulness of Neurasthenia as Affected by a Residence at the Sea-side." Dr. W. H. Daly, Pittsburg, Pa.

"The Relations of Sandy Soil and Pine Forests to Pulmonary Phthisis, with Special Reference to the Pine Belt of New Jersey." Dr. Isaac H. Platt, Lakewood, N. J.

"Open-Air Travel as a Cure and Preventive of Consumption, as Illustrated in the History of a New England Family." Dr. Henry I. Bowditch, Boston.

"Rest and Exercise in Diseases of the Heart." Dr. A. L. Loomis, New York.

"Hemoptysis from Chronic Pulmonary Disease—

a. Pathology. Dr. G. M. Garland, Boston.

b. Clinical Significance. Dr. J. T. Whittaker, Cincinnati.

c. Climatology from Standpoints of Etiology and Therapeusis. Dr. R. G. Curtin, Philadelphia.

d. Other Treatment. Dr. J. B. Walker, Philadelphia.

"Remarks on the Treatment of Pulmonary Phthisis. Dr. J. C. Wilson, Philadelphia.

"Some Observations on the Causation and Treatment of Asthma. Dr. Beverly Robinson, New York.

"The Climatic Treatment of Bronchial Asthma. Dr. F. I. Knight, Boston.

"Institution for the Treatment of Pulmonary Consumption. Dr. P. H. Kretzschmar, Brooklyn.

"The Mineral Springs of Colorado. Dr. Charles Dennison, Colorado.

"The Climate of New Mexico. Dr. R. M. Longwell, Santa Fé.

"Notes on the Prevalence of Diphtheria at High Altitudes. Dr. S. H. Chapman, New Haven.

"An Unusual Type of Pulmonary Disease Occurring in the Central Mississippi Valley." Dr. W. C. Glasgow, St. Louis.

It is our purpose to give an excerpt of the proceedings hereafter.

The Fortieth Annual Meeting of the American Medical Association was held in Newport, R. I., June 25th–28th, 1889. The arrangements made for the meeting by the local committee, Dr. Horatio R. Storer, Chairman, were remarkable for their convenience and comfort. The hospitality of the medical profession of the State, and of Newport in particular, was notable for its extent and heartiness. The only inconvenience was the want of sufficient hotel accommodation, though the number of members in attendance, about six hundred, was smaller than usual. The reason for the smaller attendance was the refusal of the Southern and Western railroad companies to make the usual reduction on fares to conventions of non-commercial bodies. But for this

there would probably have been more than half as many more ; and the mistake of holding the meeting in any city of such restricted hotel accommodation would have been still more manifest. Notwithstanding, the Association has taken the risk of repeating the mistake, by selecting Nashville, Tenn., as the next place of meeting.

While it was very generally regretted that the Western and Southern representation was, for the reason already stated, so small, nevertheless, viewed in its relation with the amount and quality of its scientific work, the Newport meeting will certainly be remembered as one of the most successful the Association has ever held.

Moreover, the Association was fortunate in not having its harmony disturbed. The question of medical ethics rippled in the shallows only among those who fail to see that regular medicine is not that which some of its votaries claim the right to establish by an exclusive code of rules, but that only which is established and maintained by an exalted standard of educational acquirements which respects and invites co-operation as a means of elevation. In the exercise of this spirit by some of the oldest members of the Association, several gentlemen not in affiliation according to the "code," on the assurance that it would not be made a barrier, were invited to read papers at this meeting. But on the eve of it they learned that, notwithstanding their preparation, and however excellent that which they would contribute might be, inspectors of the roll would be present to challenge their right to be heard. Hence, all except one, who was not a doctor of medicine, so far as we have been able to learn, had the good taste to recede rather than be made a bone of contention. But that one is sufficient to show how ridiculous the restrictions of the "code" are which exclude more than half of the non-sectarian portion of the medical profession of the State of New York from participating in the proceedings of the Association, while it admits an engineer to its privileges. Should this precedent lead to more generous action in the future based upon a cherished desire to promote knowledge instead of self-righteousness, it will not have been in vain.

It is our purpose to give an excerpt of the proceedings hereafter.

THE PROGRESS OF INFECTIOUS DISEASES AND MORTALITY RATES AT THE MOST RECENT DATES, BASED UPON OFFICIAL AND OTHER AUTHENTIC REPORTS.

ALABAMA.—*Mobile*, 40,000 : Reports 76 deaths during May, of which 27 were under five years of age. Annual death-rate, 22.8 per 1000. From zymotic diseases, 9, and from consumption, 12.

CALIFORNIA.—For the month of May, 1889, the Secretary's abstract of the reports received from 78 cities and towns, with an aggregate population of 725,450, the number of deaths was 885. Annual rate, 14.64. Deaths from consumption during the month, 146. From zymotic diseases : Diphtheria and croup, 32 ; typhoid-fever, 20 ; typho-malarial-fever, 2 ; cerebro-spinal-fever, 12 ; diarrhœal diseases, 53 ; whooping-cough, 11 ; scarlatina, 5.

San Francisco, 300,000 : During the month of May the number of deaths was 456. From zymotic diseases, 42. From consumption, 72.

Los Angeles, 80,000 : 87 ; from zymotic diseases, 23 ; consumption, 12.

Oakland, 55,000 : 63 ; from zymotic diseases, 13 ; consumption, 6.

San Diego, 32,000 : 11 ; from consumption, 5.

Sacramento, 35,000 : 36 ; from zymotic diseases, 3 ; consumption, 7.

CONNECTICUT.—The Eleventh Annual Report of the State Board for the year ending November 30th, 1888, with the Registration Report for 1887, is a volume of 560 pages. It contains in detail the reports which have appeared in our monthly summary ; minutes of the several meetings of the Board throughout the year ; sundry reports and communications on yellow-fever and the necessity for an effective national health service ; abstracts from the reports of the local boards ; reports of investigations of the causes of outbreaks of typhoid-fever and of other unsanitary conditions by the Secretary and Executive Officer ; report, in abstract, of the proceedings of

the American Public Health Association, at Milwaukee, and special contributions on River Pollution, by Samuel W. Williston, M.D. ; with Water Analyses, by Drs. Herbert E. Smith and Thomas G. Lee ; Occurrence of Small-pox in Various Towns, by the health officers respectively ; "Hatting," by A. L. Scott, of Danbury ; Gospel of Hygeia—abstract of a lecture before the Young Men's Christian Association, by C. A. Lindsley, M.D. ; Bridgeport Sewerage, by F. J. Young, M.D. ; and an important Opinion of the Arbitrators in the Matter of Appeals from Sewer Assessments, with regard to the Sewers of New London.

Aggregate estimates, registration report, 1887 : Population, 727,276 ; births, 16,583—rate per 1000, 22.8 ; marriages, 5788 ; divorces, 387 ; deaths, exclusive of 660 still-born, 12,385—rate per 1000, 17.

The greatest monthly mortality was in July, 1649 ; the smallest in November, 823. The respective quarter death-rates were : First, 15.5 ; second, 15.4 ; third, 22.4 ; fourth, 14.7.

Two thousand six hundred and fifty-one—21.4 per cent of the total mortality was from zymotic diseases—chiefly : Diphtheria, 448 ; typhoid-fever, 195 ; scarlet-fever, 117 ; measles, 95 ; whooping-cough, 70 ; small-pox, 4.

Fifteen hundred, or 12.1 per cent of the deaths were caused by consumption.

Thirteen hundred and twenty-seven, or 10.07 per cent from other diseases of the respiratory system.

The Secretary reports for May, 1889, 932 deaths from 165 towns, comprising a population of 754,722, representing an annual death-rate of 14.6. Deaths under five years of age, 178. Deaths from zymotic diseases, 135. From consumption, 119.

New Haven, 85,000 : total deaths, 108. From zymotic diseases, 11 ; consumption, 20.

Hartford, 52,000 : total deaths, 74. From zymotic diseases, 12 ; consumption, 7.

Bridgeport, 46,000 : total deaths, 84. From zymotic diseases, 8 ; consumption, 11.

Waterbury, 34,000 : total deaths, 33. From zymotic diseases, 6 ; consumption, 5.

DISTRICT OF COLUMBIA.—Total deaths during four weeks ending May 25th, 303, of which 84 were under five years of age. There were 136 deaths in the colored population. Annual death-rate, white, 14.47; colored, 23.57; total population, 17.50. Zymotic diseases caused 36 deaths, and consumption, 57.

FLORIDA.—*Pensacola*, 15,000: Reports 20 deaths in four weeks ending May 25th, 1889, of which 7 were under five years of age. Annual death-rate, 16.4 per 1000. From zymotic diseases there were 3 deaths.

GEORGIA.—*Augusta* Board of Health reports for the year 1888: Population, white, 23,500; colored, 1650: 40,000. Deaths, white, 337; colored, 518: 855. Death-rate, white, 14.34; colored, 31.39: 21.38. For the preceding year, 17.31, 38.32: 26.25; 384 of the deaths in 1887 were of children under five years of age, and of these 244 were colored.

Two hundred and fifty or 29.2 of the total number of deaths were caused by zymotic diseases, not including 15 of cerebro-spinal meningitis—diarrhœal, 143; fevers, of which 26 were typhoid and 21 malarial, 75; diphtheria and "croup," 16.

Ninety-three or 10.07 per cent were caused by consumption: 37 white and 56 colored; percentage to deaths from all causes, respectively, 10.9 and 10.8.

Notwithstanding the still inordinately large ratio of deaths from preventable causes, few American cities show better results from progressive sanitary work than Augusta. The sewerage system is still incomplete and in some respects defective, as shown by recent floods, and its progress is urged as the most important subject that now engages the attention of the Board.

"For the nine years of 1871 to 1879 inclusive, the average annual death-rate was 30 per 1000. For the nine years of 1880 to 1888 inclusive, it was 23.91. This decrease in the death-rate is equivalent to an annual saving of 216 lives.

"A further analysis of the mortality tables shows a continued decrease in death-rate among the white population. For the four years of 1880 to 1883 inclusive, the average annual death-rate was 18.07 per 1000 inhabitants, whereas for the five years of 1884 to 1888 inclusive, it was 15.40.

"The greater death-rate among the colored people is due to poverty, carelessness of sanitary requirements, ignorance or neglect of the laws of hygiene, want of skilful nursing, proper food, and medical attention. The neglect of the colored population to seek the services of physicians to minister to their sick is made painfully apparent to me every week in the year. With three skilful city physicians, ready and willing to minister to the indigent sick, there is no excuse for the death of these negroes unattended by a physician. Yet there is scarcely a week in the year in which I fail to find some negro dead who has not been attended by a doctor. After a most searching inquiry, I am fully satisfied that no fault attaches to either of the three city physicians. In some instances death among colored children was evidently due to a desire upon the part of the parents to rid themselves of the burden of maintenance of their offspring."

ILLINOIS.—*Chicago*, 830,000: Reports 1240 deaths during May, of which 545 were under five years of age. Annual death-rate, 17.09 per 1000. There were 227 deaths from zymotic diseases, and 126 from consumption.

LOUISIANA.—*New Orleans*, 254,000: Reports for four weeks ending May 25th, 616 deaths, 228 of which were among the colored population. There were 229 deaths under five years of age. Annual death-rates per 1000, white, 27.84; colored, 37.18. There were 174 deaths from zymotic diseases, and 58 from consumption.

MARYLAND.—*Baltimore*, 500,343: During the four weeks ending May 25th there were 565 deaths, of which 161 were under five years of age. Annual death-rate, 14.68 per 1000. There were 50 deaths from zymotic diseases, and 106 from consumption.

MASSACHUSETTS.—*Boston*, 415,000: There were 838 deaths during May, of which 275 were under five years of age. Annual death-rate, 24.23 per 1000. From zymotic diseases there were 119 deaths, and from consumption, 93.

MICHIGAN.—For the month of May, 1889, compared with the preceding month the reports indicate that diarrhœa and inflammation of the kidneys increased, and that influenza, remittent-fever, pneumonia, erysipelas, and pleuritis decreased in prevalence.

Compared with the average for the month of May in the three years, 1886–88, tonsillitis increased, and measles, consumption of lungs, erysipelas, and remittent-fever were less prevalent in May, 1889.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of May, 1889, at twenty-two places, scarlet-fever at forty-eight places, typhoid-fever at ten places, measles at twenty-three places, and small-pox at two places.

Reports from all sources show diphtheria reported at one place less, scarlet-fever at five places more, typhoid-fever at five places more, measles at nine places more, and small-pox at one place more in the month of May, 1889, than in the preceding month.

Detroit, 230,000: Reports 263 deaths in May, of which 46 were under five years of age. Annual rate, 13.46 per 1000. From zymotic diseases, 40, and from consumption, 30.

MINNESOTA.—*St. Paul*, 180,000: Reports for the month of May 125 deaths, of which number 54 were under five years of age. Annual rate per 1000, 8.33. From zymotic diseases there were 24 deaths, and from consumption, 12.

MISSOURI.—*St. Louis*, 440,000: Reports for May 655 deaths, of which 201 were under five years of age. Annual death-rate, 16.36 per 1000. From zymotic diseases there were 112 deaths, and from consumption, 68.

NEW HAMPSHIRE.—The following contagious and infectious diseases were reported for the month of May:

Diphtheria: Nashua, Weare, Francestown, Newport, Hancock, Manchester, Keene, and Claremont. Nashua reported ten cases.

Typhoid-fever: Rye, Keene, Exeter, Laconia, and Rochester.

Typhoid-pneumonia: Rye, one case.

Scarlet-fever: Pittsfield, Hooksett, Rye, Manchester, Claremont, Brookline, and Laconia. Manchester reports 11 cases, all light.

Whooping-cough: Brookline.

Measles: Manchester. In the epidemic of measles which was reported from Walpole last month there were 125 cases and one death. The disease is now abated.

Disinfection and isolation have been practised in the above diseases, and schools were closed in several towns until all danger was passed. There is no epidemic of any kind in the State at the present time.

NEW JERSEY.—*Hudson County*, 282,254: Reports 527 deaths for May, of which 219 were under five years of age. Annual death-rate, 22.4 per 1000. From zymotic diseases there were 118 deaths, and from consumption, 57.

Paterson, 80,000: Reports 127 deaths during May, of which 67 were under five years of age. Annual death-rate, 19.0 per 1000. There were 21 deaths from zymotic diseases, and 14 from consumption.

NEW YORK.—The reported mortality for May is less than the average for the four preceding months of the year, and less than that for May, 1888. The rate of infant mortality is also lower than for either of the preceding four months, but is a little higher than that of last year. There is a falling off in the mortality from scarlet-fever and measles, the prevalence of which has been previously noted. There is also a smaller proportion of deaths from diphtheria, 5.90 per cent of the total mortality being from this cause, or nearly one per cent less than the proportion for the four preceding months. No death from small-pox is reported, for the first time since September, 1886; it is not known to exist in any locality in the State. From all zymotic diseases there were 155.91 deaths in each 1000 deaths from all causes, being lower than for either of the preceding months of the year. From consumption there were 131.73 deaths in each 1000 deaths from all causes, and 197.13 per 1000 deaths above the age of five years.

New York, 1,571,558: There were 3165 deaths, of which

1272 were under five years. Annual rate, 24.13 per 1000. From zymotic diseases there were 617 deaths, and from consumption, 417.

BROOKLYN, 821,525 : Total deaths, 1525—655 under five years. Annual rate, 22.29. From zymotic causes, 265, consumption, 188.

Buffalo, 230,000 : Total deaths (four weeks ending May 25th), 292, of which 121 were under five years. Annual rate, 16.50. From zymotic diseases, 34, consumption, 35.

Rochester, 110,000 : Total deaths, 151—40 under five years. Annual rate, 16.48. From zymotic diseases, 14, consumption, 22.

Albany, 103,000 : Total deaths, 207, of which 63 were under five years of age. Annual rate, 24.11. From zymotic diseases, 33, and from consumption, 36.

Syracuse, 80,000 : Total deaths, 112—24 under five years of age. Annual rate, 16.80. From zymotic diseases, 9, consumption, 21.

The five towns showing the highest rates of mortality were New Utrecht, 40.80 ; Haverstraw, Medina, and Gloversville, each 36.00 ; Newton, 32.40.

The five lowest were Hector, 2.40 ; Goshen, 2.73 ; Clayton, 2.78 ; Cobleskill, 3.56 ; Lowville, 3.76.

NORTH CAROLINA.—There were 127 deaths reported during May from twenty-one towns, with an aggregate population of 121,000, of which number 41 were under five years of age. Annual death-rate, 14.4 per 1000.

Among the whites, 66,051, there were 66 deaths—14 under five years of age. Annual rate, 12.0. Among the colored, 55,049, there were 81 deaths—27 under five years of age. Annual rate, 16.8. From diarrhœal diseases there were 23 deaths : white, 14 ; colored, 9. From consumption, 20 ; white, 6 ; colored, 14.

OHIO.—Forty-eight cities and towns, with an aggregate population of 1,043,500, report 1470 deaths during the month of April, of which number 472 were under five years of age. Annual death-rate per 1000 was 16.22. From zymotic

diseases there were 267 deaths, and from consumption, 192.

Cincinnati, 325,000: Total deaths, 524; under five years of age, 186; annual rate, 19.04. Zymotic, 98; consumption, 79.

Cleveland, 235,000: Total deaths, 344; under five years of age, 146; annual rate, 12.46. Zymotic, 64; consumption, 29.

Columbus, 101,000: Total deaths, 96; under five years of age, 25; annual rate, 11.40. Zymotic, 22; consumption, 18.

Toledo, 80,000: Total deaths, 95; under five years of age, 26; annual rate, 14.25. Zymotic, 11; consumption, 8.

Dayton, 60,000: Total deaths, 71; under five years of age, 17; annual rate, 14.20. Zymotic, 10; consumption, 12.

PENNSYLVANIA.—*Philadelphia*, 1,040,245: Reports for two weeks ending May 25th, 759 deaths, of which 270 were under five years of age. Annual death-rate, 18.09 per 1000. From zymotic diseases there were 98 deaths, and from consumption, 127.

Pittsburg, 230,000: Reports 306 deaths during the four weeks ending May 25th, of which number 205 were under five years of age. Annual death-rate, 16.91. From zymotic diseases (exclusive of diarrhœal), there were 30 deaths, and from consumption, 24.

RHODE ISLAND.—Twenty-five towns, with an aggregate population of 292,115, report a mortality of 425, of which 113 were under five years of age (18 still-born). Annual death-rate, 17.4. . From zymotic diseases, 58, and from consumption, 51.

Providence, 127,000: Reports for May 204 deaths, of which 61 were under five years of age. Annual death-rate, 19.28. From zymotic diseases there were 36 deaths, from consumption, 24.

TENNESSEE.—The State Board *Bulletin* for June reports that the principal diseases, named in the order of their greater prevalence, for the month of May were dysentery, malarial-fever, rheumatism, diarrhœa, consumption, bronchitis, tonsillitis, catarrh, and puerperal-fever.

Measles are reported in the counties of Blount, Bradley, Carroll, Davidson, Henry, Knox, Madison, Marshall, Polk, and Sequatchie. Typhoid-fever in Blount, Davidson, Hamilton, Hawkins, Knox, Maury, McMinn, and Shelby. Mumps in Decatur, Henry, Houston, Madison, and Overton. Diphtheria in Hamilton, Henry, Madison, and Shelby. Scarlet-fever in Davidson, Hardin, and Shelby. Erysipelas in Campbell, Houston, and McMinn. Whooping-cough in Davidson Hamilton, and Stewart. Roseola in Robertson and Stewart. Croup in Sullivan. Cerebro-spinal meningitis in Hancock and Maury. Meningitis in Henry. Chicken-pox in Overton.

In the chief cities the respective annual death-rates for the month per 1000 of population are reported as follows :

Chattanooga,	white,	13.77 ;	colored,	29.53 :	18.90
Clarksville,	"	4.80 ;	"	16.00 :	9.00
Columbia,	"	20.00 ;	"	18.00 :	19.20
Knoxville,	"	8.83 ;	"	24.33 :	12.01
Memphis,	"	23.82 ;	"	27.07 :	25.30
Nashville,	"	9.75 ;	"	11.83 :	10.49

VIRGINIA.—*Richmond* Health Department reports for the year 1888 : Population, white, 56,000 ; colored, 44,000 : 100,-000. Births not returned. Marriages reported, 445 white, 292 colored : 737. Deaths (exclusive of 177 still-born), 916 white, 1055 colored : 1971. The highest monthly mortality was 220, in June ; the lowest 118, in May. Death-rate, white, 16.35, colored, 23.95 : 19.71. Seven hundred and thirty-six, —284 white and 452 colored, or 37.3 per cent of the total mortality was of children under five years of age. Two hundred and sixty-seven deaths—120 white and 147 colored—13.55 per cent were caused by zymotic diseases : typhoid-fever, 29 ; diphtheria and croup, 26 ; typho-malarial fever, 21 ; diarrhœal diseases, 94. Two hundred and sixteen—91 white and 125 colored—or 11.42 per cent of the total number of deaths were caused by consumption. One hundred and ninety-eight—87 white and 111 colored—were caused by other diseases of the respiratory system.

The subject most engaging the attention of the Board is *garbage disposal.* Cremation is in contemplation, but no apparatus yet agreed upon.

WISCONSIN.—*Milwaukee*, 210,000: Reports for the month of May 234 deaths, of which 61 were under five years of age. Annual death-rate per 1000, 13.4. From zymotic diseases there were 29 deaths, and from consumption, 26.

MORTALITY STATISTICS FOR 1890.

CENSUS OFFICE,
WASHINGTON, D. C., May 1, 1889.

To the Medical Profession:

The various medical associations and the medical profession will be glad to learn that Dr. John S. Billings, Surgeon U. S. A., has consented to take charge of the Report on the Mortality and Vital Statistics of the United States as returned by the Eleventh Census.

As the United States has no system of registration of vital statistics, such as is relied upon by other civilized nations for the purpose of ascertaining the actual movement of population, our census affords the only opportunity of obtaining near an approximate estimate of the birth and death-rates of much the larger part of the country, which is entirely unprovided with any satisfactory system of State and municipal registration.

In view of this, the Census Office, during the month of May this year, will issue to the medical profession throughout the country "Physician's Registers" for the purpose of obtaining more accurate returns of deaths than it is possible for the enumerators to make. It is earnestly hoped that physicians in every part of the country will co-operate with the Census Office in this important work. The record should be kept from June 1st, 1889, to May 31st, 1890. Nearly 26,000 of these registration books were filled up and returned to the office in 1880, and nearly all of them used for statistical purposes. It is hoped that double this number will be obtained for the Eleventh Census.

Physicians not receiving Registers can obtain them by sending their names and addresses to the Census Office, and, with the Register, an official envelope, which requires no stamp, will be provided for their return to Washington.

If all medical and surgical practitioners throughout the country will lend their aid, the mortality and vital statistics of the Eleventh Census will be more comprehensive and complete

than they have ever been. Every physician should take a personal pride in having this report as full and accurate as it is possible to make it.

It is hereby promised that all information obtained through this source shall be held strictly confidential.

ROBERT G. PORTER,
Superintendent of Census.

ENGLAND.—During the quarter ending March 31st, the number of deaths registered in England and Wales was 139,749, including 13,578 from the principal zymotic diseases: Measles, 5148; whooping-cough, 3138; scarlet-fever, 1544; diarrhœa, 1394; diphtheria, 1353; "fever," 993; small-pox, 8. Death-rate, for the three months, 1.90 per 1000. In the 28 large towns, including London, and having an estimated population of upward of 9,500,000, the deaths registered during the quarter corresponded to an annual rate of 20.9 per 1000—0.9 more than the general urban rate, but 2.1 per 1000 below the mean rate of these towns in the corresponding periods of the seven years preceding. In London the rate was 19.5; in the 27 other towns it ranged from 15.5 in Brighton, the lowest, to 32.3 in Blackburn, the highest; the average was 22.1.

SMALL-POX.—Deaths reported from this disease in foreign cities during the four weeks ending June 1st, 1889, as follows: Bristol, 1; Paris, 12; Lyons, 4; Havre, 8; Liege, 1; Bruges, 2; Ostend, 6; Vilvorde, 1; Dour, 3; Arlon, 1; Munich, 1; Brün, 3; Lemberg, 3; Prague, 30; Vienna, 2; St. Petersburg, 3; Warsaw, 8; Odessa, 4; Venice, 12; Bucharest, 3. During the month of April: Rome, 14; Milan, 30; Bologne, 1; Livourne, 3; Padua, 2; Valencia, 4; Marseilles, 15; Rouen, 3. During three weeks ending April 30th: Bombay, 71.

YELLOW-FEVER.—Deaths reported from this disease in Havana during the month of May, 17; during the two weeks ending June 14th, 21.

CHOLERA.—Deaths reported from this disease in Calcutta, during the week ending April 7th, 30; in Bombay, during the three weeks ending April 30th, 12.

MEDICAL EXCERPT.

THERAPEUTIC TREATMENT OF THE HAIR.—L. Hoffman, in a communication to a recent number of *Therapeut. Monatash.*, states that : "Not only in alopecia pityroïdes, but also in area Celsi, as well as in any pathologic loss of hair, the anti-parasitic theory has been confirmed." Dr. Lassar gives the following prescriptions : "The capillary surface has to be soaped for six or eight weeks every day by a well-experienced hand, later less frequently, during a time of ten minutes. The best method will be by means of a tar soap containing an abundance of tar. After thorough soaping of the scalp, the soap is washed off, and after slight drying, the head is rubbed with :

$$\text{" Sol. hydr. bichlor., } 0.5-150.00 \\ \left.\begin{array}{l}\text{Glycerini} \\ \text{Spirit. cologn.}\end{array}\right\} \bar{a}\bar{a}\ 50.00 \quad \text{M.}$$

"Then rub to dryness with absolute alcohol, with addition of one half per cent naptha, and then." And here follow four additional compounds, all containing one or more well-recognized germicidal substances, of which the first, as above given, may be regarded as typical, which, considering the non-parasitic nature of the disease and the carefulness with which the scalp is directed to be washed, using tar soap daily for six or eight weeks, appear to us to be wholly superfluous, if, indeed, they are not likely to protract the cure by superinducing cutaneous congestion.

The efficient remedy is, in our judgment, the use of tar soap—tar that is thoroughly *saponified*—such as Packer's Pine-tar Soap, and not that which consists of a mere mixture of tar with fatty substances, which is wholly devoid of saponaceous qualities, and fraught with disappointing results.—A. N. B.

TREATMENT OF STOMATITIS ULCERO-MEMBRANOSA WITH NEUTRAL CHROMATE OF POTASSIUM.—Dr. Salvator Bruno, of Rome, cured eighteen cases of this affection by painting the diseased parts with neutral chromate of potassium.

Among the severe cases he mentions that of a young girl fifteen years of age, delicate and poorly nourished. The membranous ulcerations had existed for four months. She complained of burning in the mouth, and pains during mastication. Her breath was very fœtid. Potassium chromate cured her in one week, after all other treatment had failed. In two brothers, aged twenty-two and twenty-three years, respectively, the gums were particularly affected, together with ptyalism, and infiltration of the submaxillary glands. Five days sufficed for a cure. The brush was applied twice daily. —*Rundschau*, 8, 1889.

LIME-WATER AS A PREVENTIVE OF DIABETIC COMA.—Dr. Clemens, of Frankfort, found that the usual alkaline treatment in diabetes does not prevent the abnormal hyperacidity, but rather aggravates the disease by exciting gastric disturbance. Carlsbad may temporarily relieve, but the old symptoms of acid intoxication soon reappear. Simple lime-water in daily doses of 30 to 60 grams reduces the quantity of sugar in the urine and lessens the acidity. The patient may carry a bottle of the lime-water in his pocket, and sip therefrom at occasional intervals. Considering the minute quantity of lime in the officinal lime-water, such treatment is certainly most simple. Clemens treats his cases of diabetes from the start with electricity and bromide of arsenic. He has never witnessed in his practice a case of diabetic coma.—*Allgem. Med. Centr. Zeitung*, 14, 1889.

PROSTATIC ENLARGEMENT.—Importance is attached to a new operation for the relief of this condition, devised by Dr. Hunter McGuire, of Richmond. The operation is similar to supra-pubic cystotomy for stone. The only difference is that he made the opening into the bladder as low down on its anterior wall as possible, and left the opening in the skin at the upper end of the incision. A drainage-tube was kept in for a short time. The result was that the patient passed his urine through the artificial urethra thus formed. The artificial urethra did not leak, nor did the urine dribble away, no matter what the position of the man's body was. The urine was retained for several hours, often from four to six, and then

passed in a strong stream thrown several feet from the body, the last coming in jets as from a natural outlet. The improvement in the patient upon whom he had done this operation had been wonderful. The artificial urethra or fistula had the same relation to the bladder that the spout of a coffee-pot has to the pot.—*Clinical Record.*

THE CAUSES OF DEATH AMONG GOUTY MEN.—E. Casey (*Brit. Med. Jour. and Amer. Jour. Med. Sc.*) has made an analytical study of the cause of death of 2852 men, taken from the tables of the Collective Investigation Committee; 529 of these were gouty, 1870 free from the disease, and of the remainder no information was given upon this point. The presence or absence of intemperance was also studied. The results show that Bright's disease is closely related to the gouty diathesis, and is three times as frequent a cause of death among the gouty as among the not gouty. The influence of gout in the production of heart disease is marked at the middle period of life, but not in later years. Probably the gouty cases of heart disease run their course before old age is reached. Apoplexy shows the same tendency as Bright's disease and heart disease, but in a less degree. There appears to be no relation between gout and cirrhosis, and the same is true of malignant disease and of bronchitis. Pneumonia and allied diseases appear to be less common among the gouty, but more fatal among the intemperate. Phthisis is shown to be a considerably less common cause of death among subjects of gout. Either the gouty habit tends to prevent the development of phthisis, or conversely; or the causes of the two affections are in some degree antagonistic and mutually incompatible. Finally, the gouty habit offers no obstacle to the attainment of old age in the case of temperate men.

CYANIDE OF ZINC IN CARDIAC AFFECTIONS.—Cyanide of zinc exerts, according to Professor Laschkevich, a beneficial effect on some cardiac cases which cannot be obtained by other means. In cardiac neurosis it acts quickly and certainly. Palpitation, want of rhythm, and pain in the region of the heart are quickly affected, sometimes indeed cured by this drug. The dose is from one tenth to one eighth of a grain

three times a day. Similar beneficial effects are produced when there is organic cardiac disease. The regulating action of cyanide of zinc in valvular insufficiency is less marked than is its effect on cardiac neurosis; nevertheless, there were cases in the wards where it acted better than other cardiac remedies, as digitalis, convallaria majalis, adonis vernalis, etc. In this respect it acted particularly satisfactorily in cases where other remedies could not be given without producing derangement of the gastro-intestinal system. Here it improved the action of the heart, thus increasing the secretion of urine, moderating the pulse, and diminishing the dropsy due to irritation of the gastro-intestinal canal. In a case of nervous palpitation with hysterical anuria, cyanide of zinc diminished the palpitation, and at the same time caused the secretion of urine to recommence.—*N. Y. Medical Times.*

GAY'S DISINFECTANT SOAP.—Many formulæ for these soaps have lately been given. The following, from *Nouv. Rem.* of March 8th, is said to be one of the best: Pulv. white soap, 600 gm.; sulphophenate of zinc, 15 gm.; ol. geranium rosat., 15 gm.; tr. quillaya, 20 gm.; sat. sol. (in alcohol) of eosine, 4 gm.; glycerin, 90 gm.; aq. dest. q. s. The zinc salt is dissolved in twice its weight of water and mixed with the glycerin; the solution is then heated on the sand-bath, and the soap is added, together with enough of the water to make a soft mass. The tincture is then introduced, and afterward the eosine and the essence. The tablets should be wrapped in foil.—*Pharmaceutical Era.*

PREVENTION OF BEDSORES.—Professor Rosenbach regards lanolin as a normal constituent of the human skin, and able to prevent the entrance of destructive agents into the tissucs. When patients are obliged to keep to their beds for a long time he prefers, after having fully disinfected the tender parts, to rub lanolin in thoroughly, after which he covers them with jute, oakum, or some similar material to prevent any further pressure. During the last nine months this treatment has been applied by him in a large number of chronic affections. When the excoriations and the suspicious redness of the skin were already present, healing took place kindly under the

lanolin treatment. Since adopting this treatment gangrenous ulcers from pressure are of very rare occurrence in Rosenbach's wards.—*Deut. Med. Wochenschr.*, 6, 1889.

ACRIPHOBIA.—Among the many curious physical experiences that are now attracting attention, the one to which the term "acrophobia" has been applied has many points of interest. It refers to an exaggerated condition of fear when in high places. Dr. Verga has recently described the phenomena in his own case. Though by nature not at all timid, all his courage leaves him when above ground. He has palpitations in mounting a step-ladder; finds it extremely unpleasant to ride on top of a coach, or even to look out of a first-story window. His idiosyncrasy forbids him to use an elevator, and the mere thought of those who have cast themselves down from high places causes tingling all over his person. The thought of the earth spinning though space is enough to cause discomfort. He finds this fear growing upon him as sight and hearing become less acute, and what walking in high places was formerly possible for him is getting more and more difficult. A greater or less degree of this fear is undoubtedly quite common. A very intense form of it seems perfectly consistent with normal functions.—*The Polyclinic.*

"BLACK EYE."—There is nothing to compare with the tincture or a strong infusion of capsicum annuum mixed with an equal bulk of mucilage of gum arabic and with the addition of a few drops of glycerin. This should be painted all over the bruised surface with a camel's-hair pencil and allowed to dry on, a second or third coating being applied as soon as the first is dry. If done as soon as the injury is inflicted, this treatment will invariably prevent the blackening of the bruised tissue. The same remedy has no equal in rheumatic sore or stiff neck.—*N. Y. Medical Times.*

DOSES OF SULPHONAL.—In a long study of sulphonal, *Bull. gén. de Thérap.*, March 15th, M. Egasse gives the doses as follows: For children, 15 to 25 cgm., two hours before bed-time. For women, 1 to 2 gm.; and for men, 2 to 5 gm., daily, either fractionally, or, as seems preferable, in massive doses, given

during a meal, or two hours before the hour for sleep. It is best given, finely pulverized, in capsules, but may be held for some time in suspension in dense mucilaginous mixtures. It may also be given in wine or milk.

Carbolic Acid in the Treatment of Boils.—Dr. Bidder described, at a recent meeting of the Berlin Medical Society, a new method of treating furuncles by parenchymatous injections of carbolic acid. If the boil is a small one, he gives one injection of a few drops of a solution of carbolic acid (two per cent) ; if it is of medium size, two injections are given, the half or the whole of a Pravaz syringeful of the solution being used on each occasion. In the case of large furuncles, for example, half the size of a man's hand, Dr. Bidder injects at four different spots the contents of four Pravaz syringes half or wholly filled with a solution of two per cent of carbolic acid. These injections are given only once. This treatment is strikingly successful. There is some smarting at the seat of injection at first, but the pain soon disappears, and the next day there is a marked improvement in the patient's condition. The inflammatory swelling subsides very quickly, and in eight or ten days even the largest furuncle is dispersed. By this plan no unsightly scars are left, a circumstance which in many cases is of considerable importance. The success of the treatment is probably to be accounted for by the fact that either the microbes which cause the disease are killed, or the medium in which they flourish is destroyed.—*N. Y. Medical Times.*

Plumbum Causticum in the Treatment of Condylomata.—Bockhardt praises plumbum causticum in the treatment of condylomata, especially that of the cockscomb variety, as well as in the treatment of the small, distinct, pointed, and closely crowded together condylomata where this remedy effects a radical cure. It causes by its caustic action very small ulcers which heal quite rapidly. Bockhardt recommends the formula given by Gerhardt, consisting of a 3·3 per cent solution of oxide of lead in a 33 per cent solution of caustic potash.—*Dr. Bockhardt, Monatshefte für prakt. Dermatol.*, vi., 1888.

LITERARY NOTICES.

ATLAS OF VENEREAL AND SKIN DISEASES . . . WITH ORIGINAL TEXT. By PRINCE A. MORROW, A.M., M.D., etc. Complete in fifteen parts, folio, chromo-lithographic plates. Subscription price $2 a part. New York: William Wood & Co.

Fasciculi XIV. and XV.; the concluding parts of this magnificent work, with preface and index, are now before us. The plates of these fasciculi are: Lupus Erythematosus, Vulgaris, Papillaris; Tuberculosis Papillomatosa Cutis; Sarcoma of Trunk; of Face; Epithelioma; Rodent Ulcer; Leprosy; Scabies; Pediculosis Corporis; Chomophytosis, Tricophytosis and Favus; Eczema Marginatum, Favus.

To what we have before had occasion to say in reviewing the previous parts of this superb work, it seems only necessary to add, it ends in being the most comprehensive and the most artistic work on the subjects treated of that has ever emanated from the American press.

LECTURES ON BRIGHT'S DISEASE. By ROBERT SAUNDBY, M.D., Edinburgh, Fellow of the Royal College of Physicians, London; Emeritus Senior President of the Royal Medical Society; Fellow of the Royal Medical Chirurgical Society, etc., etc. 8vo, pp. 296. Adequately illustrated. Price, $2.75. E. B. Treat, 5 Cooper Union, New York.

This volume is uniform in style with preceding volumes of medical classics by the same publisher. The subject is very thoroughly investigated, comprising extensive clinical experience and the gist of contemporary authorities. It is subdivided into Sections: I. Albuminuria—Pathology of Dropsy—of Polyuria—of Uræmia—Cordio-Vascular and Retinal Changes. II. Clinical Examinations and Tests of the Urine in Health and Disease. III. Bright's Disease: its History—Classification—Etiology—Anatomy of the Kidney—Febrile Lithemic and Obstructive Nephritis—Complications of Chronic Cases—Treatment.

There are fifty illustrations of microscopical appearances in

context with lucid descriptions of the diseases of the urinary organs. To each one of the sections is appended a very full bibliography on the subjects discussed, and at the end an unusually complete index.

SYNOPSIS OF HUMAN ANATOMY. A complete compend, including the anatomy of the viscera and numerous tables. By JAMES K. YOUNG, M.D., Instructor in Orthopædic Surgery and Assistant Demonstrator of Surgery in the University of Pennsylvania; Attending Orthopædic Surgeon; Out-patient Department, University Hospital, etc., etc. 12mo, pp. 402. Thoroughly illustrated. Price, $1.40. F. A. Davis, 1231 Filbert Street, Philadelphia, Pa. Medical practitioners and students of medicine who wish to recall all that is essential in more elaborate works on anatomy, and others who would get at the gist of the subject by the shortest route will do well to get this, the best synopsis of the subject with which we are acquainted.

DISEASES AND INJURIES OF THE EAR: THEIR PREVENTION AND CURE. By CHARLES HENRY BURNETT, A.M., M.D., Aural Surgeon to the Presbyterian Hospital; one of the Consulting Surgeons to the Pennsylvania Institution for the Deaf and Dumb, etc., etc. 12mo, pp. 160. Illustrated. Price, $1. Philadelphia: J. B. Lippincott Co. This is an admirable contribution to the "Practical Lessons in Nursing" Series by the same publishers. Divested as it is of all technicalities, it may be read with profit by all parents and nurses. Thorough familiarity with its contents will go far toward preventing most of the diseases and accidents which lead to deafness.

EXAMINATION OF WATER FOR SANITARY AND TECHNICAL PURPOSES. By HENRY LEFFMANN, M.D., Ph.D., Professor of Chemistry in the Woman's Medical College of Pennsylvania, etc.; and WILLIAM BEAM, M.A., Demonstrator of Chemistry in the Pennsylvania College of Dental Surgery, etc. 12mo, pp. 110. Philadelphia: P. Blakiston, Son & Co. This is an excellent compend of the subject of which it treats, as far as it goes, in substituting several simplified processes of water analysis in the place of other and more complicated which are

omitted. But it omits too much for a safe guide. For example, prefatorily, the authors say: "It has not been deemed necessary to attempt a description of the examination of water sediments by the microscope. Such examinations are occasionally interesting from a biological point of view, but results of positive sanitary value are rarely, if ever, attained." This is a surprising statement, in view of the fact that the most decided evidence of dangerous pollution is frequently, and sometimes exclusively, found in the sedimentitious deposit. Moreover, the authors add with regard to bacteriological examinations, "their employment is a matter of special skill and can scarcely be safely applied except by those who have had some previous training in the manipulations involved," hence they have given a very brief notice of the subject Clearly, considerably more practical knowledge is required than that which is contained in this book to make it alone reliable for sanitary purposes.

ALDEN'S MANIFOLD CYCLOPÆDIA. Volumes VIII. and IX., pp. 631, 632, carry the work forward from Ceylon to Cosmogony, packed between with information of great practical utility to every one who reads. It is throughout an unabridged dictionary of the English language, while it also contains many surprisingly complete essays on the more important subjects. For example, Ceylon takes up ten pages in an historical sketch, and an account of the recent remarkable progress made there in the cultivation of coffee and cinchona. To Chicago, also, ten pages are devoted. To Chinese Empire, twenty; Circulation of the Blood, eleven; Coal, nine; Connecticut, nine, and so forth. So justly confident is the publisher that the work will commend itself to all who examine it, he offers to send a specimen volume to any one wishing it, to be returned if not wanted. In cloth, 50 cents a volume; half morocco, 65 cents. If by mail, 10 cents extra. John B. Alden, 393 Pearl Street, New York.

IMMUNITY THROUGH LEUCOMAINES. By EUSEBIO GÜELL BACIGALUPI. Translated from the second French edition by R. F. RAFAEL, M.D. 12mo, pp. 170. New York: J. H. Vail & Co., 21 Astor Place.

This little book should find many readers among physicians and sanitarians, dealing as it does with one of the most interesting questions related to infectious diseases. Pasteurian methods are concisely described, and the author maintains, plausibly, at least, that effective matter used in the prophylaxis of rabies is no other than the leucomaines which accompany the microbe and not the microbe itself, which has, by repeated attenuations, become wholly non-virulent. And that it is in virtue of the effect of the *broth* in which germs have been cultivated until rendered so poisonous to themselves that they can no longer live or reproduce themselves in it, that the system, when inoculated, is protected against them, or their recurrence in the same system when it has once been made the medium of their culture by infection in its ordinary course; the blood in either case acquires the property of successful resistance to the germ which has been once cultivated to death in it. He sustains his theory by strong analogies which are worthy of attention.

THE MEDICAL REGISTER OF NEW YORK, NEW JERSEY, AND CONNECTICUT FOR THE YEAR COMMENCING JUNE 1ST, 1889. Published under the direction of the New York Medico-Historical Society. WILLIAM T. WHITE, M.D., Editor. 12mo, pp. 443. New York: G. P. Putnam's Sons.

This, the twenty-seventh volume of the "Green-Book," to all external appearances, except in date, resembles its immediate predecessor; contains about 150 more names of physicians in New York after allowing for deaths and removals; 310 have changed their residences. As summed up prefatorily the volume contains the names of 7203 physicians: New York, 2085; Brooklyn, 715; State of New York, 3073; New Jersey, 883; Connecticut, 445. An effort has been made to register all reputable regular physicians in the interior of the State of New York, and many new names have been added. Similar changes have been made in the lists of New Jersey and Connecticut, and in the lists of Dentists, Veterinarians, Pharmacists, and Nurses, and in the revise of the staffs of the numerous hospitals and other institutions. It is, altogether, replete with information to all persons interested in such subjects.

HANDBOOK FOR THE HOSPITAL CORPS OF THE U. S. ARMY AND STATE MILITARY FORCES. By CHARLES SMART, Major and Surgeon U. S. Army. 16mo, pp. 585. New York: William Wood & Co. It might go without saying that this book, which we announced in a previous number, is all that we anticipated of it, but it is more. It is one of the most comprehensive works of its size that has ever fallen under our observation, in its grasp of the most essential and ready methods of protecting the health, aiding the injured, meeting emergencies, nursing the sick and wounded, and of prompt medical and surgical treatment. It is adequately illustrated, with plans of hospitals, tents, camps, huts, and tents, with directions for the sanitary care of them ; how to carry the sick and wounded ; medical, surgical, and sanitary apparatus. It is alike useful to the nurse, steward, physician and surgeon, in civil no less than in military life ; to police surgeons, railway surgeons, and to all relief associations ; to sanitarians, medical and surgical practitioners of every grade and sphere, no matter where they may be—all may refer to it with profit. It is compactly and strongly bound with clasp, adapted to the pocket.

EXTRA-UTERINE PREGNANCY—A DISCUSSION. By Drs. Franklin Townsend, Joseph Price, E. T. Montgomery, W. H. Wathen, J. M. Baldy, J. B. Deaver, L. S. McMurthy, and A. VanderVeer, with an Appendix reviewing Mr. Lawson Tait's Ectopic Gestation and Pelvic Hematocele, reprinted from the Transactions of the American Association of Obstetricians and Gynecologists, is a book of seventy pages with illustrations, giving the gist of an exceedingly important subject by accomplished gynecologists, of interest to all medical practitioners. Philadelphia : William J. Dorman.

THE TIMES AND REGISTER: the Philadelphia *Medical Times*, *Medical Register*, and *Dietetic Gazette* consolidated, with Dr. William F. Waugh, editor. The subscriptions and advertisements of the two periodicals dropped and the whole corps of workers hitherto employed thereon are now all engrafted upon the *Times and Register*, together with the good will and promised assistance of Dr. John V. Shoemaker, who

retires from active editorial duties, owing to the pressure of other literary work.

The *Times and Register* will appear every Saturday, and promises to be among the foremost medical periodicals in the country. Three dollars a year ; ten cents a number. Medical Press Co., 1752 Arch Street, Philadelphia.

SOCIAL LIFE IN RUSSIA, by the VICOMTE EUGÈNE MELCHIOR DE VOGÜÉ, continued in *Harper's Magazine* for June, presents in successive graphic descriptions of the types of life on the great estates of the Russian seigneurs.

PAMPHLET REPRINTS, ETC., RECEIVED.

"Fermented Milk." By B. P. Brush, M.D., Mount Vernon, N. Y.

"An Annual Census." By Sir Edwin Chadwick, K.C.B., London.

"Fees in Hospitals." By Henry J. Bigelow, M.D., Boston, Mass.

"Infectious Diseases in their Relations to the Public Schools." By L. W. Baker, M.D., Baldwinsville, Mass.

"How shall we Deal with the Inebriate?" By L. W. Baker, M.D., Baldwinsville, Mass.

"Production of Lean Meat in Mature Animals." "Does Heating Milk Affect the Quality or Quantity of Butter?" Cornell University, College of Agriculture.

"Efficacy of Filters and other Means Employed to Purify Drinking-Water." By Charles G. Currier, M.D., New York.

"Yellow-fever. Absolute Protection Secured by Scientific Quarantine." By Wolfred Nelson, 32 Nassau Street, New York.

"Public Health a Public Duty. The Organization, Powers, and Relations of Local, State, and National Boards of Health." Presidential Address, Sixteenth Annual Meeting of the American Public Health Association. By Charles N. Hewitt, M.D., Red Wing, Minn.

"Crime: Its Physiology and Pathogenesis. How Far can Medical Men Aid in its Prevention?" By John Morris, M.D., Baltimore, Md.

"Air, Its Uses and Abuses. How Perfect Ventilation can be Secured Under all Circumstances." The Gouge Heating and Ventilating Co., New York.

"Rectal Diseases." By E. F. Hoyt, M.D., New York.

"Typhoid fever and Water-supply in Omaha." By W. F. Milroy, M.D., Omaha, Neb.

"Seventy-first Annual Report of the State Asylum for the Relief of Persons Deprived of their Reason," Philadelphia, Pa.

"Eleventh Annual Report of the Eye, Ear, and Throat Charity Hospital," Baltimore, Md.

"Eighth Annual Report of the Brooklyn Training School for Nurses."

"Eighteenth Annual Report of the Buffalo State Asylum for Insane."

"Twentieth Annual Report of the Brooklyn Eye and Ear Hospital."

"Thirty-sixth Annual Report of the Pennsylvania Training School for Feeble-minded Children," Elwyn, Pa.

"Report of the Committee on Ophthalmology and Otology." By Seth S. Bishop, M.D., Chicago.

"On the Relation of the Nasal and Neurotic Factors in the Ætiology of Asthma." By F. H. Bosworth, M.D., *et al.*, New York.

"Intubations of the Larynx in Diphtheritic Croup." By Dillon Brown, M.D., New York.

"The Question of Interfering with the Abscesses of Hip Disease." By A. B. Judson, M.D., New York.

"Prevention of Yellow-fever in Florida and the South." By Wm. C. Van Bibber, M.D., Baltimore, Md.

"Twenty-eighth Annual Report of the Cincinnati Hospital."

"On the Microscopical Examination of Urinary Sediment." By W. B. Canfield, M.D., Baltimore, Md.

"The Training of Nurses." By Hal C. Wyman, M.S., M.D., Detroit, Mich.

"Contributions to the Development of the Teeth." By Carl Heitzmann, M.D., and C. F. W. Bödecker, D.D.S., M.D.S.

"Osteotomy for Anterior Curves of the Leg." By De Forest Willard, M.D., Philadelphia, Pa.

THE SANITARIAN.

AUGUST, 1889.

NUMBER 237.

POPULAR PROGRESS IN STATE MEDICINE.

THE ADDRESS IN THE SECTION ON STATE MEDICINE AT THE FORTIETH ANNUAL MEETING OF THE AMERICAN MEDICAL ASSOCIATION, JUNE 25TH, 1889.

By J. BERRIEN LINDSLEY, M.D., of Nashville, Tenn., Chairman of the Section.

THE Section on State Medicine has two feet upon which it securely stands—law and science. My immediate predecessor as Chairman of the Section has noticed the recent progress in science as connected with its practical work. On this occasion I shall, with great brevity, note progress in the other direction. As in America all law depends upon the sovereign will of the people, who are at once governors and governed, my topic is substantially "Popular Progress in State Medicine."

This progress is one of the great features of the present century, which is as signally characterized by the application of the physical forces to the daily uses of man as was the fifteenth by the unfolding of the globe's map. Thirty years ago sanitary ideas, problems, reforms, and work were unknown, or at all events unmentioned. To-day, outside of partisan politics with its perquisites, no topics engross so large a share of public attention as do those belonging to practical sanitation.

As evidence of the recent and rapid progress State Medicine has made in the United States, the following substantial proofs may be cited :

STATE BOARDS OF HEALTH.

The first State Board of Health created was that of Massachusetts, at a date no longer ago than 1869. From a table very carefully compiled by Dr. George Homan, Secretary of the State Board of Health of Missouri, we learn that, in 1888, twenty-nine States maintained Boards of Health, by an annual expenditure of more than half a million dollars. Thus a major portion of the American people are becoming acquainted with the connection between law and health.

In most instances these Boards have high powers. In all cases they exercise a great educational influence.

Voluminous reports, prepared with care, and with special adaptation to the several localities, are liberally distributed. At this date the series issued by those two advanced States, Massachusetts and Michigan, constitute a cyclopædic collection of treatises upon all the pressing questions of public sanitation. The Illinois Board has exerted a lasting influence upon medical education by its persistent efforts to protect the people from imposition. Perhaps it is not beyond fact to say that a very few years of legal effort by this single State Board has done more to elevate medical education than all the advisory and hortatory resolutions of our own great Association in forty years. Law is a rapid and efficient educator. No less than eight of these twenty-nine State Boards issue monthly publications containing reports and information from all localities within their bounds. These periodicals are circulated by the thousand, and tend materially to advance the work. All date within the last four years.

CITY AND LOCAL BOARDS OF HEALTH.

The progress, influence, powers, and expenditures of city boards of health in the recent decade is even more remarkable than in the case of State Boards. I have not at hand such an analysis of their work as that furnished by Dr. Homan, above referred to. However, a single topic under their care reveals the wide scope of their functions and the immense results which must in a few years ensue. Healthful homes for all the people is becoming their watchword and the demand of their constituencies. To exemplify this point time forbids. The

work done by the New York, Boston, and Nashvile boards may be cited in proof.

A wonderful illustration happened in Europe only a few days ago (June 15th), when the King, Queen, and Crown Prince of Italy inaugurated the improvement of the sanitary condition of Rome. This grand work will require ten years for its completion. Many new streets will be opened and 17,000 houses will be demolished.

The American Democracy long since voted itself public schools by means of which the keys of knowledge are placed in the hands of all. Witness Massachusetts, which for its last scholastic year voted without grudging the royal sum of $7,500,000.

The American Democracy will, beyond a doubt, long before the next century becomes old, vote that each man, woman, and child of its many millions, everywhere upon its imperial domain, shall breathe the pure air of heaven and enjoy that bright sunshine which is the truest emblem of the Divine Giver of all life.

Ever since my student days in that loved Alma Mater, the glorious old University of Pennsylvania, have I, as opportunity offered, inspected the dwellings of the masses in our large cities, and always with sadness and compassion, that so many among them fared no better than like classes in the Old World. Now, when these scenes meet my eyes, it is with the comforting reflection that such disgraces upon our vaunted civilization will soon pass away.

VOLUNTARY ASSOCIATIONS.

These are rapidly becoming a power. On April 18th, 1872, in the rooms of the New York City Board of Health, seven pioneers founded the American Public Health Association, which now counts its membership by the hundreds. This Association has published fourteen substantial and handsome volumes, permanent memorials of the best thoughts of very many of the most eminent practical sanitarians in America. By the thoughtful liberality of a single member, Mr. Henry Lomb, of Rochester, N. Y., it has sent many thousand copies of capital essays among classes specially needing and prizing such instruction.

The Newport Sanitary Protection Association is a model in its way, which in a very few years will be widely copied in all parts of our great Republic.

The New York Ladies' Sanitary Association, recently formed, has some 350 members. It has taken hold of such great subjects as defects in public school buildings, the removal of garbage, and the like. Though in its infancy, it is already noted for good work.

This is very remarkable, and has done much to give our cause prestige with the people. The sayings of D'Israeli the gifted, and of other eminent British statesmen, have become axioms. No greater tribute, however, has ever been paid to State preventive medicine than the idea recently advanced by an American Secretary of State, looking to the peaceable acquisition of a great island now a plague-spot, a terror and a menace to our people, that so it may come under the redeeming influence of sanitary science.

In 1884 and 1885 France, Spain, and Italy were visited by an epidemic of Asiatic cholera which alarmed all Europe, and created great uneasiness in our own country, specially in the vast Interior Valley. In all previous visitations of this exotic pest it was allowed free course. On this occasion, however, it was met by the organized hosts of scientific physicians acting with the power of law, and was stopped short in its career. This fact has given the American public great respect for and great confidence in State preventive medicine, as I know from conversing with many outside our profession.

Yellow-fever epidemics, and even yellow-fever scares, are now of national importance because of their disastrous influence upon interstate commerce. The scare of last year damaged more or less all the railway companies with extensive lines in the South, probably more than the really great epidemic of 1878, which was so fatal to life. This because of the increase in mileage of these railroads. During the continuance of this scare and consequent embargo upon commerce, very many railroad and mercantile men studied and discussed the perplexing topic of quarantine. These men represented millions upon millions of capital and multiplied thousands of employés. One sentiment prevailed among them, respect for State Boards, abhorrence of local shot-gun quarantines, and a

desire for a central Federal head at Washington which should co-operate with State Boards and harmonize quarantine rules. There are no better auxiliaries in public health work in the South than our railroad officials. The depopulation of Decatur, Ala., when yellow-fever was declared epidemic, as conducted by the management of the Louisville and Nashville Railroad, was a model for promptness, efficiency, and humanity.

The recent astounding calamity of May 31st, in Pennsylvania, has also awakened a widespread feeling of the necessity of a Federal hand which in such unexpected and destructive calamities shall be ready to aid local authorities with that promptness and wealth which great governments alone can exhibit. In such times of trouble there should be no necessity for the slow, uncertain, and costly agency of voluntary contributions from individuals among 65,000,000. Our Government is a Commonwealth of States, and at its Capitol has all the organization for mutual insurance against earthquakes, floods, and pan-epidemic pestilence that can possibly be needed.

As it respects numbers interested and capital involved, life insurance is second to no business in America. Without vital statistics it walks in darkness. With local sanitation it is intimately concerned. A company at Hartford has within ten years sent an accomplished physician twice to Tennessee on an inspecting tour, whose reports give an admirable summary of the sanitary condition of that State, though never published. This kind of inspection is more frequent than health officers are aware. It is impartial and meant for business uses alone. Unhealthy countries are embargoed by life insurance companies, for a single epidemic may destroy the resources of years.

THE BUSINESS INTERESTS OF AMERICA NOW DEMAND THE UNITED STATES PUBLIC HEALTH SERVICE.

This topic for twenty years past has been much discussed in medical associations, national and State ; also in sanitary conventions of all kinds. Various plans have been proposed with widely different features. At one time, 1879, a National Board of Health was created, from which much was expected.

These expectations were disappointed, and perhaps inevitably, since this Board was not in harmony with the machinery of the United States Government. Perhaps, also, because it was mainly established under the spur of an epidemic disease which affected only one section of the Union and did not concern the people of more than half the States.

Every one conversant with the development of bureaus and departments at Washington is aware of the fact that in each instance they are the outgrowth of progress in the separate States, and of the wants of large classes of people.

After many States had created agricultural bureaus, boards or commissioners, and after the farmers had become widely interested in the matter, Congress enacted a Bureau of Agriculture. After a while this was exalted into a Department, without a seat in the President's Cabinet council. Very recently it has made the last step in advancement, and its head is a full Cabinet minister. Nearly all the States had systems of public schools before the Bureau of Education was created, which, under the long and successful administration of Commissioner Eaton, passed from infancy to vigorous manhood. This Bureau works in perfect harmony with the State Superintendents of Public Instruction. It gathers, arranges, and collates a vast amount of educational statistics and information not coming under State purview. It represents the vast corps of teachers in the Union at Washington, increases the self-respect of this large body of influential citizens and, as a consequence, grows continually stronger in the public esteem.

There is now at Washington nearly all the provision or machinery of a Health Department worthy this mighty people, which yet does not satisfy the public demand for want of enlargement and co-ordination. A service nearly a century old, established originally as an act of charity to a heedless class, and supported by a tax upon that class, has, by a singularly interesting process of evolution, expanded into a Bureau with four exceedingly important drawers. The care of the United States Marine Hospitals, once its sole function and the cause of its creation, is now only one of its duties, a great charity though it be, with a chain of splendid buildings perfectly equipped and ably managed. All honor to him who conceived the idea of elevating this service from the low estate into

which partisan administration had reduced it. All honor to those who have changed it from sinecure posts for party reward to scientific positions for genuine merit.

Last year, in pursuance with an earnest request from the American Medical Association, Congress greatly enlarged the ability of this service to take charge of maritime quarantine, so that now this, one of the chief functions of a National Health Bureau, is by common consent placed in its hands, with funds and powers amply sufficient for most efficient work. Surely this addendum far outweighs in importance and esteem its moderate hospital work.

Curiously enough, last year also a threatened epidemic of yellow-fever brought a demand upon the central Government for assistance which could not be refused, inasmuch as a contingent fund for just such purposes had been placed to the order of the President, who could find no other channel through which to extend relief than this same old seaman's friend. Thus interstate quarantine and aid fell under its wing. And though this may be a temporary work, yet when occasion does occur for its performance, in magnitude and importance it dwarfs even maritime quarantine. A fourth drawer in this nondescript bureau is the direction of investigations throwing light upon the causes and prevention of diseases, which has been committed to its charge in more than one instance by Act of Congress during the few years just passed.

Thus it would seem that the United States Marine Hospital Service has altogether outgrown its name. It should be styled the United States Public Health Service, while retaining essentially its present organization. Maritime quarantine, interstate quarantine and aid, and scientific researches, with its original work, should constitute four separate sub-departments with ample funds and full clerical force. The head of the whole should be, as now, a Supervising Surgeon-General. This is better than a bureau with a political appointee at its head. The term Service is significant and it is popular.

The United States Signal Service, Life Saving Service, Light Service, are doing much to render the Government revered as a benefactor instead of being regarded as a harsh tax-gatherer. The small sum expended upon lights along both banks of the Mississippi River has done more to lighten

toil, mitigate danger, and save loss of life and property, than immense sums expended in other channels.

The United States Public Health Service thus established, by a process not of revolution but evolution, can be most efficiently aided in its wide field of action by three existing agencies at Washington, each of which has been long in operation with universal favor and popular support.

First. The United States Signal Service. Climatology is of late admitted by all to be a most important branch in the study of preventive medicine. It will not be long before weather warnings will be more in request for health purposes than even now for commercial and agricultural reasons. One or two clerks in the Public Health Service can obtain and coordinate all the weather knowledge it may need as effectually as if the two services were combined in one.

Second. The United States Census Bureau of Vital Statistics. Every ten years the Government, in connection with the enumeration of the people required by our polity of representation, sets to work a Supervisor of Mortality and Vital Statistics for that special census. This office should be permanent and the work continuous. All admit the supreme importance of accurate vital statistics as the very basis of practical sanitation. The experience of over a century shows that the States and Territories will not efficiently provide these statistics. A few large and wealthy States may, but, judging the future from the past, the youngest grandchild of our great-grandchildren will not live to see America on a par with Great Britain in this, the very basis of a high civilization. This work is eminently within the province of the Federal Government, and will find with the people a welcome not less warm than that extended to the postal or weather services.

Third. The United States Coast and Geodetic Survey. A minute topographical survey is an essential in sanitary work. Great Britain, France, and even Spain, a country which we ignorantly much underrate, have either perfected or are perfecting topographical maps on a scale of several inches to the mile. These maps are perfect delineations of the country. In America there is not a single State thus mapped, and perhaps never will be. It is a costly work, requiring time and highest scientific skill. This, too, is eminently an undertaking

for the Federal Government, of absolute necessity from a military standpoint no less than for public health reasons.

That a complete Weather Service in each State under the control and support of the United States ; that the permanent collection, collation, and publication of the vital and mortuary statistics of each State under the same authority ; and that a minute topographical survey of each square mile in the three and a half millions over which floats our flag, is also its legitimate work, follows logically from the fact that each and all of these great factors in the people's progress to a civilization higher than any which has yet been attained by humanity, are eminently national in their character and relations ; and also from the further fact that their cost is far beyond the means at the disposal of the States. Be it always remembered that the States have surrendered to the Federal Government the two lucrative sources of revenue, customs and excise duties, and thus left themselves poor.

Above is briefly sketched the outline of a plan which, without jostling or jarring, but simply by expansion and co-ordination, will give what the American Medical Association has so often and earnestly demanded—a Public Health Service worthy our Continental Republic, which, though but a century old, already rivals in influence, fame, and future hopes the mighty Republic of antiquity whose name is even now a synonym for dominion.—*The Journal.*

THE OFFICERS-ELECT OF THE AMERICAN MEDICAL ASSOCIATION for the ensuing year are as follows :

President, E. M. Moore, of New York ; First Vice-President, J. W. Jackson, of Missouri ; Second Vice-President, W. W. Kimball, of Minnesota ; Third Vice-President, J. H. Warren, of Massachusetts ; Fourth Vice-President, T. B. Evans, of Maryland ; Treasurer, R. J. Dunglison, of Pennsylvania ; Permanent Secretary, W. B. Atkinson, of Pennsylvania ; Librarian, C. H. A. Kleinschmidt, D. C. To deliver Address on General Medicine, Dr. N. S. Davis, of Illinois ; General Surgery, Hunter McGuire, of Virginia ; State Medicine, Alfred L. Carroll, of New York.

The next place of meeting, Nashville, Tenn.

CONSIDERATIONS CONCERNING SOME EXTERNAL SOURCES OF INFECTION IN THEIR BEARING ON PREVENTIVE MEDICINE.

THE ADDRESS IN STATE MEDICINE DELIVERED BEFORE THE AMERICAN MEDICAL ASSOCIATION AT NEWPORT ON JUNE 28TH, 1889.

By WILLIAM H. WELCH, M.D., Professor of Pathology in Johns Hopkins University, Baltimore.

NO department of medicine has been cultivated in recent years with such zeal and with such fruitful results as that relating to the causes of infectious diseases. The most important of these results for preventive medicine and for the welfare of mankind is the knowledge that a large proportion of the causes of sickness and death are removable.

It is evident that efforts to preserve health will be most intelligently and effectually applied when they are based upon an accurate and full knowledge of the agencies which cause disease. Public and private hygiene, however, cannot and, fortunately, has not waited for the full light of that day, whose dawn has only begun to appear, when we shall have a clear insight into the causation of preventable diseases. Cleanliness and comfort demand that means shall be taken to render pure the ground on which we live, the air which we breathe, and the water and food with which we are supplied, and we must meet these needs without waiting to learn just what relation infectious agents bear to the earth, air, water, and food.

It is a fortunate circumstance that modern sanitation has been controlled so largely by the belief in the dependence of endemic and epidemic diseases upon organic impurities in the soil and in the water. Incomplete and even erroneous in many respects as are the views which have prevailed concerning the origin and spread of epidemic diseases by the decomposition of organic substances, the sanitary measures which have been directed toward the removal of filth have achieved

great conquests in limiting the development and extension of many infectious diseases. The benefits which one commonwealth of this country has derived from the intelligent employment of public sanitary measures were clearly and forcibly presented before this Association last year by Dr. Walcott, in his admirable address in State Medicine.

While nothing should be said or need be said to lessen the importance of cleanliness for public health, it is important to bear in mind that hygienic cleanliness and æsthetic cleanliness are not identical. In water which meets the most severe chemical tests of purity, typhoid bacilli have been found. On the other hand, the air in the Berlin sewers, which certainly does not meet the most modest demands of æsthetic cleanliness, has been found to be nearly or quite free from bacteria.

It needs only to be stated to be generally admitted that the scientific basis of preventive medicine must be the accurate knowledge of the causative agents of preventable diseases, a knowledge which can be derived only from a careful study of all the properties of these agents, the modes of their reception and of their elimination by the body, the circumstances which favor and those which retard or prevent their development and spread, their behavior in the various substances which surround us or which we take into our bodies, and the sources of infection, not only those which laboratory experiments show to be possible, but those which are actually operative.

So long as we were unacquainted with the living organisms causing infection, the means at our disposal for studying the etiology of infectious diseases were limited to the observation of all the circumstances which we could determine regarding the origin and spread of these diseases. We could only infer what might be the properties of the infectious agents from the study of phenomena often obscure and difficult of interpretation. Chiefly by this method of investigation the science of epidemiology has been built up. It has established facts and laws no less of practical than of scientific importance. But it has left unsolved many problems and has filled gaps with speculations. Admitted epidemiological facts are often open to various interpretations.

We are evidently at a great advantage when we can study

the epidemiological facts with a knowledge of the substances which actually cause infection, and this we are now enabled to do for a limited number of the infectious diseases. This new method of research, which thus far has been mainly bacteriological, has aided us not so much by simplifying the problems of etiology, which still remain complicated enough, as by affording greater accuracy to the results.

It is my aim in this address to consider some results of the modern studies of pathogenic micro-organisms in their bearing upon preventive medicine, more particularly upon the sources of infection. It is, of course, impossible within the limits of the address to attempt a complete survey of this important field. Time will permit the presentation of only some of the salient points.

Infectious diseases are those which are caused by the multiplication within the body of pathogenic micro-organisms.

It has always been recognized that some infectious diseases, such as the exanthematous fevers, are conveyed directly from the sick to the healthy. It is not disputed that in these evidently contagious diseases the infectious germ is discharged from the body in a state capable at once of giving rise to infection.

In a second group of infectious diseases, of which malaria is the type, the infected individual neither transmits the disease to another person, nor, so far as we know, is capable of infecting a locality. Here there is reason to believe that the infectious germ is not thrown off in a living state from the body, but is destroyed within the body. In this group the origin of infection under natural conditions is always outside of the body.

In a third group there is still dispute whether the disease can be transmitted directly from person to person, but all are agreed that the infected individual can infect a locality. It is especially fortunate that the bacteria which cause cholera and typhoid-fever, the two most important representatives of this group of so-called miasmatic-contagious diseases, have been discovered and isolated in pure culture. These are the diseases about whose origin and epidemic extension there has been the greatest controversy. They, above all other diseases, have given the impulse to public sanitation during the

last half century. The degree of success with which their extension in a community is prevented is an important gauge of the excellence of the local sanitary arrangements. A clear comprehension of the origin and spread of these diseases signifies the solution of many of the most vexed and important problems of epidemiology and of State hygiene.

It is difficult to understand how those who accept the discovery that the bacteria causing typhoid-fever and cholera have been found and cultivated from the stools of patients affected with these diseases can doubt that these patients are possible sources of contagion, or can entertain the view once so widely prevalent, that the infectious germs of these diseases are discharged from the body in a condition incapable of producing immediate infection. In an address delivered on another occasion, I have endeavored to present the considerations which reconcile the comparative infrequency of direct contagion for these diseases with the belief in the elimination of the causative germs in an active state from the body, and have there pointed out several well-known factors which determine the frequency of conveyance of an infectious disease by contagion. There are reasons, some of them very obvious, why diseases in which the infectious substances are operative only when received into the digestive tract, and are discharged usually only with the fæces, are less likely to be transmitted by immediate contagion than those diseases in which the virus is thrown off from the skin on epidermal scales.

But the field of operation of direct contagion for these so-called miasmatic-contagious diseases is at most a restricted one, and the chief sources of infection are outside of the body from which primarily the infectious germs may have been derived. It is to these external sources of infection, which are of such importance in public hygiene, that I wish especially to direct attention.

A full comprehension of the sources of infection is, of course, to be obtained only by a detailed study of the etiology of the individual infectious diseases, but this is impossible within the limits of an address. It may, however, be useful to present some of the facts which have a general bearing upon the subject. Let us consider, then, from the point of view of modern bacteriological studies, what *rôle*, in harboring or in transport-

ing infectious agents, may be played by those substances or media with which we necessarily come into intimate contact, such as the air, the ground, the water, and our food.

It is universally admitted that many infectious agents may be transported by the air, but the extent of danger from this source has often been exaggerated. It is a popular error to suppose that most of the minute particles of dust in the air either are or contain living organisms. The methods for determining the number and kind of bacteria and fungi in the air are now fairly satisfactory, although by no means perfect. These have shown that while the number of living bacteria and fungi in the atmosphere in and around human habitations cannot be considered small, still it is greatly inferior to that in the ground or in most waters. Unlike fungus spores, bacteria do not seem to occur to any extent in the air as single detached particles, which would then necessarily be extremely minute, but rather in clumps or attached to particles of dust of relatively large size. As a result in a perfectly quiet atmosphere these comparatively heavy particles which contain bacteria rapidly settle to the ground or upon underlying objects, and are easily filtered out by passing the air through porous substances, such as cotton-wool, or sand. Rain washes down a large number of bacteria from the air.

That the air bacteria are derived from the ground, or objects upon it, is shown by their total absence, as a rule, from sea air at a distance from land, this distance naturally varying with the direction and strength of the wind.

A fact of capital importance in understanding the relations of bacteria to the air, and one of great significance for preventive medicine, is the impossibility of currents of air detaching bacteria from moist surfaces. Substances containing pathogenic bacteria, as, for instance, sputum containing tubercle bacilli or excreta holding typhoid bacilli, cannot, therefore, infect the air unless these substances first become dry and converted into a fine powder. We are able to understand why the expired breath is free from bacteria and cannot convey infection, except as little particles may be mechanically detached by acts of coughing, sneezing, or hawking. Those bacteria, the vitality of which is rapidly destroyed by complete desiccation, such as those of Asiatic cholera, evidently are not

likely to be transported as infectious agents by the air, if we except such occasional occurrences as their conveyance for a short distance in spray.

The only pathogenic bacteria which hitherto have been found in the air are the pus organisms, including the streptococcus found by Prudden in a series of cases of diphtheria and tubercle bacilli ; but no far-reaching conclusions can be drawn from the failure to find other infectious organisms when we consider the imperfection of our methods and the small number of observations directed to this point. The evidence in other ways is conclusive that many infectious agents—and here the malarial germ should be prominently mentioned—can be and often are conveyed by the air. While we are inclined to restrict within narrower limits than has been customary the danger of infection through the air, we must recognize that this still remains an important source of infection for many diseases. All those, however, who have worked practically with the cultivation of micro-organisms have come to regard contact with infected substances as more dangerous than exposure to the air, and the same lesson may be learned from the methods which modern surgeons have found best adapted to prevent the infection of wounds with the cosmopolitan bacteria which cause suppuration.

We are not, of course, to suppose that infectious germs floating in the form of dust in the atmosphere are dangerous, only from the possibility of our drawing them in with the breath. Such germs may be deposited on substances with which we readily come into contact, or they may fall on articles of food where they may find conditions suitable for their reproduction, which cannot occur when they are suspended in the air in consequence of the lack of moisture.

From the facts which have been mentioned concerning the relations of bacteria to the air, what points of view present themselves to guide us in preventing infection through this channel? Surely something more than that this purpose is accomplished simply by abolishing foul odors.

Certain indications are so plain as to need only to be mentioned in this connection, such as the disinfection and removal, as far as possible, of all infected substances, an indication which applies equally to all channels of infection, and which it

is much easier to mention than it is to describe how it shall be realized. But there are two indications which apply especially to the prevention of the transportation of disease germs by the air. One is the necessity of guarding, as far as practicable, against the desiccation, when exposed to the air, of substances which contain infectious germs not destroyed by drying, and another is free ventilation.

For no disease is the importance of the first of these indications so evident and so well established as for tuberculosis, the most devastating of all infectious diseases. Against this disease, formidable as it may seem to cope with it, the courageous crusade of preventive medicine has begun, and is destined to continue.

It is now generally recognized that the principal, although not the sole, sources of tuberculous infection are the sputum of individuals affected with pulmonary tuberculosis and the milk of tuberculous cows. Cornet, who has made a laborious and most instructive experimental study of the modes and dangers of infection from tuberculous sputum, has also elaborated the practical measures which should be adopted to diminish or annihilate these dangers. These measures have been so recently and so widely published in medical journals, and so clearly presented before a section of this Association, that I mention them only to call the attention of practitioners of medicine to their importance, and to emphasize the fact that infectious substances of such nature as tuberculous sputum should not be allowed to become dry and converted into dust when exposed to the air.

By means of free ventilation, disease-producing micro-organisms which may be present in the air of rooms are carried away and distributed so far apart that the chance of infection from this source is removed or reduced to a minimum. It is a well-established clinical observation that the distance through which the specific microbes of such diseases as small-pox or scarlatina are likely to be carried from the patient by the air, in such concentration as to cause infection, is small, usually not more than a few feet, but increases by crowding of patients and absence of free ventilation. The well-known experiences in the prophylaxis and treatment of typhus-fever are a forcible illustration of the value of free ventilation.

It is, of course, not to be understood that by ventilation we accomplish the disinfection of a house or apartment. Ventilation is only an adjunct of such disinfection which, as already mentioned, is of first importance. Time will not permit, nor is it in the plan of this address, to discuss the details of such questions as house disinfection, but I may be permitted to say that the methods for disinfecting apartments have been worked out on a satisfactory experimental basis, and should be known at least by all public health officers. Whether it be pertinent to this occasion or not, I cannot forbear to add my protest to that of others against placing reliance upon any method hitherto employed of disinfecting houses or apartments by fumigation. And I would, furthermore, call attention to the lack in most cities of this country of public disinfecting establishments such as are in use with excellent results in many cities of Europe, and which are indispensable for the thorough and convenient disinfection of clothing, bedding, carpets, curtains, etc.

After this short digression let us pass from the consideration of the air as a carrier of infection to another important external source of infection—namely, the ground. That the prevalence of many infectious diseases depends upon conditions pertaining to the soil cannot be questioned, but the nature and extent of this influence have been and are the subjects of lively discussion. The epidemiological school led by Pettenkofer assigns, as is well known, to the ground the chief and even a specific and indispensable influence in the spread of many epidemic diseases, particularly cholera and typhoid-fever. The statistics, studies, and speculations of epidemiologists which have related to this subject probably surpass in number and extent those concerning any other epidemiological factor. The exclusive ground hypothesis has become an ingenious and carefully elaborated doctrine with those who believe that such diseases as cholera and typhoid-fever can never be transmitted by contagion. These authorities cling to this doctrine with a tenacity which indicates that on it depends the survival of the exclusively localistic dogma for these diseases.

To all who have not held aloof from modern bacteriological investigations it must be clear that views which have widely prevailed concerning the relations of many infectious germs to

the soil require revision. The question is still a difficult and perplexing one, but on some hitherto obscure or misunderstood points these investigations have shed light, and from the same source we may expect further important contributions to a comprehension of the relations of the ground to the development of infectious diseases.

The ground, unlike the air, is the resting or the breeding-place of a vast number of species of micro-organisms, including some which are pathogenic. Instead of a few bacteria or fungi in a litre as with the air, we find in most specimens of earth thousands, and often hundreds of thousands, of micro-organisms in a cubic centimetre. Fränkel found the virgin soil almost as rich in bacteria and fungi as that around human habitations.

This vast richness in micro-organisms belongs, however, only to the superficial layers of the earth. Where the ground has not been greatly disturbed by human hands there is, as a rule, about three to five feet below the surface an abrupt diminution in the number of living organisms, and at the depth where the sub-soil water usually lies, bacteria and fungi have nearly or entirely disappeared. Fränkel, who first observed this sudden diminution in the number of micro-organisms at a certain level beneath the surface, explains this singular fact by the formation at this level of that sticky accumulation of fine particles consisting largely of bacteria which forms the efficient layer in large sand filters for water. Of course, the number of bacteria and the depth to which they penetrate will vary somewhat with the character, especially the porosity, of the soil and its treatment, but the important fact that all, or nearly all, of the bacteria and fungi are retained in the ground above the level of the sub-soil water will doubtless hold true for most situations.

The conditions are not favorable for the multiplication of bacteria in the depth of the ground, as is shown by the fact that in specimens of earth brought to the surface from a depth of a few feet, the bacteria which are at first present rapidly multiply. What all of the conditions are which prevent the reproduction of bacteria in the deep soil has not been ascertained, but the fact necessitates similar precautions in the bacteriological examination of the soil as in that of water.

We have but meagre information as to the kinds of bacteria present in the ground in comparison with their vast number. Many of those which have been isolated and studied in pure culture possess but little interest for us so far as we know. To some of the micro-organisms in the soil appears to be assigned the *rôle* of reducing or of oxidizing highly organized substances to the simple forms required for the nutrition of plants. We are in the habit of considering so much the injurious bacteria that it is pleasant to contemplate this beneficent function so essential to the preservation of life on this globe.

Among the pathogenic bacteria which have their natural home in the soil, the most widely distributed are the bacilli of malignant œdema and those of tetanus. I have found some garden earth in Baltimore extremely rich in tetanus bacilli, so that the inoculation of animals in the laboratory with small bits of this earth rarely fails to produce tetanus. In infected localities the anthrax bacillus and in two instances the typhoid bacillus, so far as it was possible to identify it, have been discovered in the earth. There is reason to believe that other germs infectious to human beings may have their abiding-place in the ground; certainly no one doubts that the malarial germ lives there. As the malarial germ has been shown to be an organism entirely different from the bacteria and the fungi, we cannot apply directly to its behavior in the soil and its transportation by the air, facts which have been ascertained only for the latter species of micro-organisms, and the same precautions must be observed for other diseases with whose agents of infection we are not acquainted, as, for instance, yellow-fever.

In view of the facility with which infectious germs derived from human beings or animals may gain access to the soil, it becomes a matter of great importance to determine how far such germs find in the soil conditions favorable for their preservation or their growth. We have, as is well known, a number of epidemiological observations bearing upon this subject, but with few exceptions these can be variously interpreted, and it is not my purpose to discuss them. The more exact bacteriological methods can, of course, be applied only to the comparatively small number of infectious diseases, the causa-

tive germs of which have been isolated and cultivated, and these methods hitherto have been applied to this question only imperfectly. We cannot regard the soil as a definite and unvarying substance in its chemical, physical, and biological properties. What has been found true of one kind of soil may not be so of another.

Moreover, we cannot in our experiments bring together all of the conditions in nature which may have a bearing on the behavior of specific micro-organisms in the soil. We must, therefore, be cautious in coming to positive conclusions on this point on the basis of experiments, especially those with negative results. With these cautions kept constantly in mind, the question, however, is one eminently open to experimental study.

The experiments which have thus far been made to determine the behavior of infectious micro-organisms in the ground have related especially to the bacilli of anthrax, of typhoid-fever, and of cholera, and, fortunately, these are the diseases about whose relations to the ground there has been the most discussion and concerning which we are most eager to acquire definite information.

As regards anthrax bacilli, it has been determined that in ordinary garden or field earth they do not multiply, but in earth contaminated by blood, urine, or fæces their reproduction can occur. They can grow on various vegetable substrata. There is no reason to doubt, therefore, that the anthrax bacilli can find in or on the ground suitable conditions for their multiplication, although such conditions are not everywhere present. For durable infection of the soil with anthrax bacilli it is, however, more important that these bacilli should find there suitable conditions for the formation of spores, than that they should be able simply to multiply. The vegetative forms of anthrax bacilli would not, as a rule, be able to survive for a great length of time the hostile influences which they are likely to encounter in the ground, such as insufficient or exhausted nutriment, absence of sufficient moisture, and the attacks of saprophytic organisms. On the other hand, against these injurious influences the anthrax spores have great resistance. In the superficial layers of the ground the anthrax bacilli may often find those conditions of

moisture, of temperature, of oxygen supply, and of insufficient food which we know are most favorable for the development of their spores ; indeed, Soyka has shown that the ground presents often these conditions better than our culture media. A circumstance discovered by Feltz, which, however, needs confirmation, is, if true, of not little significance. He finds that anthrax bacilli may undergo a progressive diminution in virulence in the soil. If this should be true likewise of other infectious micro-organisms, we should be able to account, in some instances, for the variable degree of virulence which clinical observation indicates that certain agents of infection acquire. So far as anthrax bacilli are concerned we may conclude, therefore, that the ground occasionally offers suitable conditions for their reproduction, but what is of greater importance, it offers especially favorable conditions for their long-continued preservation in the form of spores. I must forego here the further consideration of the special circumstances inherent in the soil which control the origin and spread of epidemics of anthrax in cattle, although many interesting investigations have been directed to this subject.

Of greater interest to physicians is the behavior of typhoid and of cholera bacteria in the ground. As has already been intimated the ground is regarded by Pettenkofer and his school as the principal breeding-place of these micro-organisms outside of the body. This view, however, is not supported by bacteriological investigations. Inasmuch as the cholera and the typhoid bacilli may multiply on various vegetable substrata and substances derived from animals, at temperatures often present in the ground, it is evident that here and there conditions may be present for their growth in the ground, but this growth is likely to be soon interrupted by the invasion of ordinary saprophytic organisms and other harmful influences. The typhoid bacilli are more hardy in resisting these invaders than are the cholera bacteria, which easily succumb, but even for the former, so far as our present knowledge extends, the ground can rarely serve as a favorable breeding-place.

It is not, however, necessary that these organisms should multiply in order to infect for a considerable time the ground ; it is sufficient if their vitality is preserved. As to this latter

point, the reports of different investigators are not altogether concordant. Such excellent observers as Koch, Kitasato, and Uffelmann found that the cholera bacteria, when added to fæces or a mixture of fæces and urine, rapidly diminished in number, and at the end of three, or four days at the most, had wholly disappeared. In a mixture of the intestinal contents from a cholera corpse with earth and water Koch found numerous cholera bacteria at the end of three days, but none at the end of five days. On the other hand, Gruber reports the detection of cholera bacteria in cholera dejecta fifteen days old. The weight of bacteriological evidence, therefore, is opposed to the supposition that the bacteria of Asiatic cholera preserve their vitality for any considerable time in the ground or in the excreta.

With respect to the bacilli which cause typhoid-fever, it has been shown by Uffelmann that these may live in fæces, mixture of fæces and urine, and mixture of garden earth, fæces, and urine for at least four and five months, and doubtless longer, although they may die at the end of a shorter period. He also finds that under these apparently unfavorable conditions some multiplication of the bacilli may occur, although not to any considerable extent. Grancher and Deschamps found that typhoid bacilli may live in the soil for at least five months and a half. Unlike the cholera bacteria, therefore, the typhoid bacilli may exist for months at least in the ground and in the fæcal matter, holding their own against the growth of multitudes of saprophytes. This difference in the behavior of cholera and of typhoid germs is in harmony with clinical experience.

As regards other infectious bacteria than those which have been considered, I shall only mention that tubercle bacilli, although incapable of multiplication under the ordinary conditions of nature outside of the body, may preserve their vitality for a long period in the ground, on account of their resistant character, and, furthermore, that the pyogenic cocci, on account of their considerably resistant nature and their modest demands in the way of nutriment, can be preserved and sometimes probably grow in the ground. Indeed, the staphylococcus pyogenes aureus has been found in the earth by Lübbert.

The conclusion which we may draw from the observations mentioned is that, in general, the soil is not a good breeding-place for most of the infectious bacteria with which we are acquainted, but that it can retain for a long time with unimpaired vitality those which produce spores or which offer considerable resistance to injurious agencies, such as anthrax bacilli, tubercle bacilli, and the pyogenic cocci.

In order to become infected with bacteria in or on the ground, these bacteria must in some way be introduced into the body, and we must, therefore, now attempt to determine how bacteria may be transported to us from the ground. So various and intricate are the possibilities for this transportation that it is hopeless to attempt to specify them all.

There occurs to us first the possibility of the conveyance of infectious micro-organisms from the soil by means of currents of air, a mode of carrying infection which has already been considered. Here I shall only repeat that the wind can remove bacteria from the ground only when the surface is dry and presents particles of dust, and that the sole, and perhaps the chief danger is that we may inhale the infected dust.

Manifold are the ways in which we may be brought into contact with infectious bacteria in the ground, either directly, or indirectly by means of vegetables to which particles of earth are attached, by the intervention of domestic animals, by the medium of flies or other insects, and in a variety of other ways, more or less apparent.

An important, doubtless for some diseases the most important, medium of transportation of bacteria from an infected soil is the water which we drink or use for domestic purposes. From what has been said, it is evidently not the sub-soil water which is dangerous, for infectious like other bacteria cannot generally reach this in a living state, but the danger is from the surface-water and from that which trickles through the upper layers of the ground, as well as from that which escapes from defective drains, gutters, cesspools, privy vaults, and wrongly constructed sewers, or improper disposal of sewage. I shall have something to say presently of water as a source of infection, and shall not further elaborate here the dangers of infection of drinking-water through contaminated soil, dangers which, especially as regards typhoid-fever, are

widely appreciated in this country, even if often imperfectly counteracted.

A point which has been much discussed and one of interest, is whether bacteria which are in the depth of the ground can come to the surface. Two agencies especially have been considered by some as capable of transporting bacteria from the depth to the surface. One is ascending currents of air in the ground, and the other is the capillarity of fluids in the minute pores of the ground. The first of these suspected agencies must be unquestionably rejected in view of the fact that even a few inches of sand is sufficient to filter all of the bacteria out of the air, even when it is in much more rapid motion than can occur within the ground. Moreover, that degree of dryness which is essential for the detachment of bacteria by air-currents is not likely to be present much below the surface of the ground. The experiments which have been made to determine to what extent bacteria may be carried upward by the capillarity of fluids in the ground have not yielded harmonious results, but the weight of evidence is opposed to the belief that this is a factor of any considerable importance for this purpose.

From what has been said concerning the growth of pathogenic bacteria in the soil we shall not be inclined to attribute to the multiplication and the motility of these organisms much influence in changing their place in the ground.

The somewhat sensational *rôle* assigned by Pasteur to earthworms of bringing bacteria to the surface cannot be wholly ignored, and has received support from observations of Bollinger regarding anthrax, but it is questionable whether much importance is to be attached to this agency.

Regarding the depth to which typhoid bacilli may penetrate the soil, the experiments of Grancher and Deschamps show that at the end of five weeks they may reach a depth of sixteen to twenty inches below the surface. As Hoffmann has demonstrated the extraordinary slowness with which fluids and fine particles penetrate the soil, it is probable that in the course of time a greater depth than this may be reached. Indeed, Macé claims to have found in soil in the neighborhood of a well, suspected of infection, typhoid bacilli, together with ordinary intestinal bacteria, at a depth of at least six and one half feet

below the surface. There are a number of instances recorded in which there is reason to believe that turning up the soil and cleaning out privies or dung-heaps in which typhoid stools have been thrown, have given rise to typhoid-fever, even after the infectious excreta have remained there a year and more.

It cannot be said that bacteriological investigations have as yet shed much light upon a factor which plays a great *rôle* in epidemiology—namely, predisposition to infection from the ground according to locality and time, and this deficiency receives constant and vehement emphasis from the localistic school of epidemiologists. We can, however, readily understand that varying conditions, such as temperature, moisture, porosity, quality of soil, may exert a controlling influence in determining the behavior of infectious germs in the soil and the facility of their transportation to human beings or animals. As regards that much-discussed question, the significance of variations in the height of the sub-soil water in relation to the prevalence of certain epidemic diseases, particularly cholera and typhoid-fever, we now know that this cannot depend upon the presence of bacteria in the sub-soil water itself or in the capillary layers immediately above it. It has been plausibly suggested that with the sinking of the sub-soil water fluids from infected cesspools, privy vaults, and other localities may more readily be drawn into wells or other sources of water-supply, and that by the same cause the surface of the ground becomes dry so that dust particles may be lifted by the wind. Other more or less plausible explanations have also been offered, but it must be confessed that our positive information on this point is meagre. There can, however, be little doubt that this significance of the variations in sub-soil water is apparent only for certain localities, and has been considerably exaggerated and often misunderstood. It is not, however, pertinent to my theme to discuss this or other purely epidemiological observations concerning the relations of the ground to the spread of epidemic diseases, interesting and important as are many of these observations.

Before leaving the subject of the ground as a source of infection, permit me to indicate briefly some conclusions which may be drawn from what has been said as to the principles

which should guide us in preventing infection directly or indirectly from the ground.

First in importance is to keep infectious substances as far as possible from the ground. This implies the early disinfection or destruction of such substances as typhoid and cholera excreta and tuberculous sputum.

Second. The ground should be rendered as far as practicable unsuitable for the continued existence of infectious germs. This, at least for some diseases, is accomplished by a proper system of drainage, which, moreover, for other reasons possesses hygienic importance.

Third. Means should be provided to prevent waste products from getting into the ground around human habitations or from gaining access to water used for drinking or domestic purposes. In cities this can be accomplished only by a properly constructed system of sewers. The system of storing waste products in cesspools whence they are to be occasionally removed cannot be approved on hygienic grounds. There are conditions in which the disposal of waste products in deep wells only used for this purpose and whence these products can filter into the deep layers of the ground may be permissible, but this can never be considered an ideal method of getting rid of excrementitious substances, and is wholly wrong in regions where wells are used for drinking-water. But I am trespassing with these remarks upon a province which does not belong to me but rather to practical sanitarians and engineers. I shall only add that the advantage gained by preventing organic waste from soaking into the ground is not so much that the ground is thereby rendered less adapted to the existence of infectious micro-organisms, but is due rather to the fact that this waste is likely to contain infectious germs.

Finally, in cities, good pavements, absence of unnecessary disturbance of the soil, cleanliness of the streets, and laying of dust by sprinkling, are not only conducive to comfort but are sometimes hygienically important in preventing infection from the ground and dust.

In passing from the consideration of the ground to that of water, one feels that he now has to do with a possible source of infection against which in this country and in England he is at liberty to make any accusation he chooses without fear

of contradiction. There is reason to believe that such accusation has been repeatedly made without any proof of misdemeanor on the part of the water. It is not, therefore, with any desire to awaken further the medical or the public conscience that I wish to say a few words concerning the behavior of bacteria in water and the dangers of infection from this source. That such dangers are very real, must be apparent when we consider the universal employment of water and its exposure to contamination from all kinds of sources.

Ordinary water, as is well known, contains bacteria in large number. Not a few species of bacteria can multiply rapidly and to a large amount even in distilled water. These are the so-called water-bacteria, and, like most of the micro-organisms found in ordinary drinking-water, are perfectly harmless saprophytes. What we wish to know is, how pathogenic micro-organisms conduct themselves in water. Can they grow or be preserved for any length of time in a living condition in water? As regards the multiplication of pathogenic bacteria in water, the results of different experimenters do not altogether agree. Whereas Bolton failed to find any growth, but rather a progressive diminution in number of pathogenic bacteria planted in sterilized water, Wolffhügel and Riedel observed a limited reproduction of such bacteria, including those of typhoid-fever and of cholera. This difference is due probably to the methods of experimentation employed. According to Kraus, these latter bacteria diminish rapidly in number in unsterilized spring or well-water kept at a low temperature. These experiments indicate that water, even when contaminated with more organic impurities than are likely ever to be present in drinking-water, is not a favorable breeding-place for pathogenic bacteria. Still, it is to be remembered that these laboratory experiments do not reproduce exactly all of the conditions in nature, and it may happen that in some nook, or cranny, or vegetable deposit at the side of a well or stream some pathogenic bacteria may find suitable conditions for their multiplication.

But, as has been repeatedly emphasized in this address, it is not necessary that pathogenic bacteria should actually multiply in a medium in order to render it infectious. It is sufficient, if their life and virulence are not destroyed in a very

short time. As to this important point, Bolton found that in sterilized water typhoid bacilli may preserve their vitality for over three months, and cholera bacteria for eight to fourteen days, while Wolffhügel and Riedel preserved the latter in water for about eighty days. Under natural conditions, however, these organisms are exposed to the overgrowth of the water-bacteria, so that Kraus found in unsterilized water kept at a temperature of 10.5° C. (50.9° F.), the typhoid bacilli no longer demonstrable after seven days, and the cholera bacteria after two days. The conditions in Kraus's experiments were as unfavorable as possible for the continued existence of these pathogenic bacteria, more unfavorable than those often present at the season of prevalence of cholera and typhoid-fever; nevertheless, I do not see that the experimental results justify the conclusions of Kraus as to the slight probability of drinking-water ever conveying infection with the germs of typhoid-fever and of cholera. To render such a conclusion probable it would be necessary to demonstrate a much shorter preservation than even Kraus himself found. In judging this question it should not be overlooked that infection of drinking-water with the typhoid or the cholera germs is not so often the result of throwing typhoid or cholera stools directly into the source of water-supply, as it is the consequence of leaky drains, cesspools, privy vaults, or infected soil, so that there may be continued or repeated accessions of infected material to the water.

In view of the facts presented, there is no sufficient reason, therefore, from a bacteriological point of view, for rejecting the transmissibility of typhoid-fever and cholera by the medium of the drinking-water. This conclusion seems irresistible when we call to mind that Koch once found the cholera bacteria in large numbers in the water of a tank in India, and that the typhoid bacilli have been repeatedly found in drinking-water of localities where typhoid-fever existed. Nor do I see how it is possible to interpret certain epidemiological facts in any other way than by assuming that these diseases can be contracted from infected drinking-water, although I know that there are still high authorities who obstinately refuse to accept this interpretation of the facts.

In this connection it may be mentioned that pathogenic

bacteria may preserve their vitality longer in ice than in unsterilized drinking-water. Thus, Prudden found typhoid bacilli still alive which had been contained in ice for one hundred and three days.

When we come to consider the ways in which water may become infected with pathogenic micro-organisms we recognize at once a distinction, in this respect, between surface water and sub-soil water. Whereas the sub-soil water may be regarded under ordinary circumstances and in most places as germ-free, the surface water, such as that in rivers and streams, is exposed to all manner of infection from the ground, the air, and the direct admission of waste substances. Unfortunately, in the ordinary way of obtaining sub-soil water for drinking purposes, by means of dug wells, this distinction is obliterated, for the water which enters these wells free from bacteria is converted into a surface water often exposed, by the situation of the well, to more dangerous contamination than other surface waters used for drinking purposes.

Now let us turn our attention, as we have done with other sources of infection, to a brief outline of certain general principles which may help us in avoiding infection from the water.

We shall, in the first place, avoid as far as possible the use of water suspected of infection, especially with the germs of such diseases as typhoid-fever and cholera. When it is necessary to use this suspected water it should be boiled.

As regards the vital question of water-supply, it may be stated as a general principle that no hygienic guarantee can be given for the purity of surface water which has not been subjected to a proper system of filtration, or for the purity of spring or well water fed from the sub soil unless such water is protected from the possibility of infection through the upper layers of the soil or from the air. This is not saying that water which meets certain chemical and biological tests, and which is so situated that the opportunities for its contamination appear to be absent or reduced to a minimum, is not admissible for the supply of drinking-water, but the possibility of infection can be removed only by the fulfilment of the conditions just named, and upon these conditions the hygienic purist will always insist.

Unfortunately, we have at present no domestic filters which

are satisfactory, and most of those in common use are worse than none, as they soon furnish a filtrate richer in bacteria than the original water. The only effective method of water-filtration for the general supply is by means of large sand filters, such as are in use with excellent results in Berlin and some other cities. These require skilled attention. I cannot on this occasion discuss the construction or working of these filters, but would refer those who are interested to the full and careful investigations of the Berlin filters by Wolffhügel and by Plagge and Proskauer.

What is accomplished by these artificial sand filters is accomplished under natural conditions also by the ground, which furnishes a sub-soil water free from micro-organisms, and to obtain pure water we have only to devise means by which this sub-soil water may be secured without the chance of contamination. Just as the water, which has passed through the sand filters, is collected in suitable reservoirs and is distributed in pipes, which do not admit contamination from without, so by means of properly constructed artesian or driven wells we may secure the naturally filtered sub-soil water with the same freedom from the chances of infection.

It is well to bear in mind that no biological or chemical tests of water can replace those measures which have been mentioned as necessary to secure purity of water-supply. These tests are of value only when applied with proper precautions and with due consideration of the special circumstances of each case for which they are employed.

There has been much profitless discussion as to whether greater significance is to be attached to the chemical or to the bacteriological examination of water. Each has its own special field of application, and in this the one cannot replace the other method. The bacteriological examination has for hygienic purposes the advantage that it may enable us to detect the specific agents of infection in the form of micro-organisms, as has already been done for cholera bacteria and typhoid bacilli, but this is a comparatively rare result, and does not at present afford a wide field of application for this method. The significance of the bacteriological test is to be based more frequently upon the fact that it concerns itself with the same class of micro-organisms to which some of the recognized and

doubtless many of the undiscovered infectious agents belong, and from the behavior of which in some respects conclusions can be drawn as to the behavior of the pathogenic organisms. Thus the bacteriological test is the only one which enables us to judge correctly of the efficacy of those methods of filtration of surface water and of construction of wells which insure purity of water-supply. The points of view from which we can estimate correctly, according to our present knowledge, the relative merits and fields of application of the chemical and of the bacteriological methods of water examination have been clearly indicated by Plagge and Proskauer and by Wolffhügel. The theme is one beyond the limits or the scope of this discourse, and I have referred to it chiefly to emphasize the fact that we cannot rely upon chemical or bacteriological tests of water to the exclusion of those protective measures which have been mentioned, although I do not intend to imply that each of these tests when properly employed does not afford important information and is not of great value in many cases.

I have already taxed so largely your time and patience that I must pass over with brief mention the food as a source of infection. Unlike those external sources of infection which we have hitherto considered, many articles of food afford an excellent nutritive medium for the growth of a number of species of pathogenic micro-organisms, and in many instances this growth may be abundant without appreciable change in the appearance or taste of the food.

When we consider in how large degree the certainty and the severity of infection with many kinds of pathogenic microorganisms depend upon the number of such organisms received into the body, we can appreciate that the danger of infection from food which contains a mass of growing pathogenic bacteria may be much greater than that resulting from the reception of infected water or air, media in which infectious organisms are rarely present in other than a very dilute condition. The entrance into the body of a single infectious bacterium with the inspired air is, at least in the case of many diseases, not likely to cause infection ; but let this bacterium fall upon some article of food, as for instance upon milk, where it can multiply in a short time at a favorable temperature many

thousandfold, and evidently the chances of infection become vastly increased.

Among the various agencies by which infectious organisms may gain access to the food may be mentioned the deposition of dust conveyed by the air, earth adhering to vegetables, water used in mixing with or in the preparation of food, in cleansing dishes, cloths, etc., and contact in manifold other ways with infected substances.

Fortunately, a very large part of our food is sterilized in the process of cooking shortly before it is partaken, so that the danger of infection from this source is greatly diminished and comes into consideration only for uncooked or partly cooked food and for food which, although it may have been thoroughly sterilized by heat, is allowed to stand considerable time before it is used. Milk, in consequence of its extensive employment in an unsterilized state and of the excellent nutritive conditions which it presents to many pathogenic bacteria, should be emphasized as especially liable to convey certain kinds of infection—a fact supported not less by bacteriological than by clinical observations. Hesse found that also a large number of ordinary articles of food prepared in the kitchen in the usual way for the table and then sterilized afford a good medium for the growth and preservation of typhoid and cholera bacteria, frequently without appreciable change in the appearance of the food.

Upon solid articles of food bacteria may multiply in separate colonies, so that it may readily happen that only one or two of those who partake of the food eat the infected part, whereas with infected liquids, such as milk, the infection is more likely to be transmitted to a larger number of those who are exposed.

In another important particular the food differs from the other sources of infection which we have considered. Not only the growth of infectious bacteria, but also that of bacteria incapable of multiplication within the body may give rise in milk and other kinds of food to various ptomaines, products of fermentation, and other injurious substances which when ingested are likely to cause more or less severe intoxication, or to render the alimentary tract more susceptible to the invasion and multiplication of genuinely infectious organisms.

It is plain that the liability to infection from food will vary according to locality and season. In some places and among some races the proportion of uncooked food used is much greater than in other places and among other races. In general, in summer and in autumn the quantity of fruit and food ingested in the raw state is greater than at other seasons, and during the summer and autumn there is also greater danger from the transportation of disease germs from the ground in the form of dust, and the amount of liquids imbibed is greater. The elements of predisposition according to place and time, upon which epidemiologists are so fond of laying stress, are not, therefore, absent from the source of infection now under consideration.

I have thus far spoken only of the secondary infection of food by pathogenic micro-organisms, but, as is well known, the substances used for food may be primarily infected.

Chief in importance in this latter category are the various entozoa and other parasites which infest animals slaughtered for food. The dangers to mankind resulting from the diseases of animals form a separate theme which would require more time and space than this address affords for their proper consideration. I shall content myself on this occasion with only a brief reference to infection from the milk and flesh of tuberculous cattle.

It has been abundantly demonstrated by numerous experiments that the milk from tuberculous cows is capable, when ingested, of causing tuberculosis. The milk may be infectious not only in cases in which the udder is tuberculous, but also when the tuberculous process is localized elsewhere. How serious is the danger may be seen from the statistics of Bollinger, who found with cows affected with extensive tuberculosis the milk infectious in eighty per cent of the cases, in cows with moderate tuberculosis the milk infectious in sixty-six per cent of the cases, and in cows with slight tuberculosis the milk infectious in thirty-three per cent of the cases. Dilution of the infected milk with other milk or with water diminished or, if in sufficient degree, it removed the dangers of infection. There is reason to believe that many of the so-called scrofulous affections in children are due to infection from milk derived from tuberculous cows. Probably for adults the danger

of acquiring tuberculosis from the use of infected milk is relatively small. Bollinger estimates that at least five per cent of the cows are tuberculous. From statistics furnished me by Mr. A. W. Clement, V.S., it appears that the number of tuberculous cows in Baltimore which are slaughtered is not less than three to four per cent. Among some breeds of cows tuberculosis is known to be much more prevalent than this.

There is no evidence that the meat of tuberculous cattle contains tubercle bacilli in sufficient number to convey infection, unless it be very exceptionally. Nevertheless, one will not willingly consume meat from an animal known to be tuberculous. This instinctive repugnance, as well as the possibility of post-mortem infection of the meat in dressing the animal, seem good grounds for discarding such meat. The question, however, as to the rejection of meat of tuberculous animals has important economic bearings, and has not been satisfactorily settled. As to the propriety of the rejection of the milk from such animals, a matter, however, not easily controlled, there can be no difference of opinion.

The practical measures to adopt in order to avoid infection from the food are for the most part sufficiently obvious. Still it is not to be expected that every possibility of infection from this source will be avoided. The pleasure of living would be destroyed if one had his mind constantly upon escaping possible dangers of infection. It is difficult to discuss the matters considered in this address without seeming to pose as an alarmist. But it is the superficial and half knowledge of these subjects which is most likely to exaggerate the dangers and awaken unreasonable fears. While one will not, under ordinary circumstances, refrain from eating raw fruit or food which is palatable, although it may not have been thoroughly sterilized by heat, or from using the natural water unboiled, in the fear that he may swallow typhoid or cholera bacteria, still in a locality infected with typhoid-fever or cholera he will, if wise, not allow himself the same freedom in these respects. Cow's milk, unless its source can be carefully controlled, when used as an habitual article of diet, as with infants, should be boiled or the mixed milk of a number of cows should be selected ; but this latter precaution offers less protection than the former.

In most places in this country we are sadly lacking in good sanitary inspection of the food, especially of the animal food, offered for sale. One cannot visit the admirable slaughter-house in Berlin or that in Munich, and doubtless similar ones are to be found elsewhere, and watch the intelligent and skilled inspection of the slaughtered animals without being impressed with our deficiency in this respect. In large cities an essential condition for the efficient sanitary inspection of animal food is that there should be only a few places, and preferably only one place, where animals are permitted to be slaughtered. Well-trained veterinarians should be selected for much of the work of inspection.

It may reasonably be asked that the National Government, which has already spent so much money for the extermination of such diseases as pleuro-pneumonia of cattle and hog cholera, which are not known to endanger the health of mankind, should turn some of its resources and energies also to means for the eradication of tuberculosis from cattle, which is a scourge not only to the economic interests of farmers and dairymen, but also to the health of human beings.

Without any pretension to having done more in this address than to sketch here and there a few principles derived from bacteriological researches concerning only some of the most widely distributed external sources of infection, I trust that enough has been said to show the folly of any exclusive dogma as to modes of infection. The ways of infection, even in one and the same disease, are manifold and various, and can never be resolved into exclusive hypotheses, such as the drinking-water hypothesis, the ground hypothesis, etc.

It follows, therefore, that it is not by sanitary improvements in one direction only that we can control the spread of preventable epidemic diseases. In one situation improvements in the supply of drinking-water check the prevalence of typhoid-fever, in another place similar measures show no such influence ; or again, in one city the introduction of a good system of sewerage diminishes epidemic diseases, and in another no similar result follows. We should, therefore, aim to secure as far as possible good sanitary arrangements in all directions and in all respects.

It has also been rendered evident in what has been said

that infectious agents differ markedly from each other in their behavior, so that while public sanitation aims at those measures which are found to be most widely beneficial, it should not forget that each infectious disease is as much a separate problem in its prophylaxis as in its symptomatology, etiology, and treatment. It will not aim to combat cholera with the means found best suited to scarlet-fever, but it will adapt preventive measures as directly to the specific end in view as possible.

In presenting to you the results of researches, chiefly bacteriological, concerning the scientific basis of preventive medicine, I hope to escape the accusation of one-sidedness and narrowness by the statement that I do not for a moment intend to imply that the bacteriological method is our only source of accurate knowledge on the subjects which have been considered. My aim is accomplished if I have succeeded in making clear that this method has established facts which aid in a clearer conception of the causes of some important infectious diseases, in a better understanding of the sources and dangers of infection, and in a more efficient selection and application of sanitary measures.

If this science of only a few years' growth has furnished already acquisitions to knowledge so important, so far-reaching, may we not look forward with assurance to the solution of many dark problems in the domain of infectious diseases, problems the solution of which may yield to preventive medicine a future of usefulness and success which we cannot now foresee.—*Medical News.*

ORANGES.—In less than twenty years the production of oranges in Florida has increased from nothing to 3,000,000 boxes for export. There are 150 varieties known to growers, and by care and selections the Florida orange grower may fill the markets with his fruits all the year round. Several varieties of pineapple are also successfully grown in Florida.

IMMUNITY AND IMMUNIZATION.

By H. Buchner.

ABSTRACT OF A LECTURE DELIVERED BEFORE THE MEDICAL SOCIETY OF MUNICH.

Immunity in its full meaning signifies a condition of the body which *permanently* opposes the development of infectious processes. But there are conditions which act *transiently* in the same way against the danger of infection already existing. Buchner exemplifies this by a person attacked with typhus. In this case the disease, the continuous multiplication of bacilli, is not terminated before all tissues acquire transient immunity against the fungi. But what are the means by which the organism acquires immunity in a permanent or transitory way? To answer this question Buchner first refers to Pasteur's protective inoculation, the actual efficiency of which is generally admitted at the present time. Buchner calls it a great triumph that it should be possible to immunize a living organism in this way without hurting its tissues. Again, another means of immunization comes from France. Chamberland and Roux have injected intraperitoneally the chemical substances of bacteria (ptomainia) in experiments on animals affected with malign œdema and with anthrax, without taking the bacteria themselves. The animals were actually rendered resistant to inoculation with living bacilli of the corresponding disease. This discovery is practically very important, inasmuch as the effects of chemical agents for the purpose of immunization are certainly more accurately measurable than those of living fungi. Theoretically, the discoverers neglected drawing the necessary consequences from their results, and this has been done by Buchner with zealous energy.

He prefaces his developments with a discussion of the means by which transitory immunity may be obtained. It might be possible to neutralize specific ptomaines in the organism by means of certain substances, just as Behring succeeded in de-

composing the ptomaine of cholera-vibrios, cadaverine, by means of iodoform. Nature uses inflammation as an antidote against the invasion of fungi. Ten years ago Buchner pointed to this reaction of the organism by which it acquires transient immunity, but at the present day he disposes of proofs for his hypothesis.

In a former lecture, Buchner has described anthracic pneumonia produced by inhalation of anthrax bacilli. Its symptoms are those of a sero-fibrinous hemorrhagic pneumonia. In the alveoles, an exudation abounding in cellules and immense quantity of anthrax bacilli. On the other hand, the pulmonary capillaries and the larger vessels were absolutely devoid of bacilli, the spleen containing only a very few of them.

For the purpose of investigating the modus by which the agents of infection are arrested in their further invasion, Buchner has lately instituted some experiments which led to the conclusion that "inflammatory reaction not only possesses the power of arresting the passage of bacteria through the pulmonary surface, but actually to cause degeneration of the infectious bacteria, and consequent destruction."

We are not permitted here to give in detail the interesting experiments which Buchner, jointly with Dr. Schickhardt, has performed on animals infected with anthrax bacilli. The microscopical result confirmed Buchner's hypothesis that inflammation originates in consequence of the bacillus, but that conversely, once originated, it induces degeneration in the bacillus, and may doubtless cause its complete decay. The latter hypothesis is corroborated by the shapeless agglomerations of granules which are found, and which represent a transformation of the bacilli. In accordance with the fact of an anti-bacterial, immunizing action of inflammation, Ribbert and Lahr have ascertained, after injecting staphylococcus avoreus into the trachea, that the local inflammation prevents the bacteria from penetrating into the organism, and subsequently causes them to degenerate and to die.

Emmerich, and similarly Paulowski, have tried already to utilize these experiences in a practical way, the former by his experiments with injection of erysipelas-cocci in animals affected with anthrax; the latter by establishing the fact that

even simple saprophytic fungi, as, for instance, micrococcus prodigosus, have a restraining curative influence on simultaneous anthracic infection. It may be possible in some other way, as tried already by Landerer by means of Peruvian balsam, to create in the organism a condition of excitation which might be used as a means of immunization. Through what kind of chemical and microscopical conditions an inflammatory excitation, or immunity acquired by protective inoculation, may act deleteriously on the bearers of infection is explained on the results of Metschnikoff's well-known phagocytic theory. In Buchner's opinion this theory constitutes one of the greatest additions to our morphological and physiological science of infectious processes. Metschnikoff's doctrine, opposed from many sides, draws its principal importance from the fact of having demonstrated that viable, pathogenic bacteria may indeed be devoured by cellular elements. It explains how leucocystic and other cellular elements migrate into certain tissues in a condition of inflammatory excitation and exposed to infection, there to display their phagocytic action. It is true, Buchner does not consider everything explained by this process alone. On the contrary, a certain chemical reaction and concentration of the different tissue-fluids seems to be necessary for the debilitation and destruction of the fungi.

Buchner, on the ground of experiment, is inclined to suppose fluid substances which, formed by the febrile process, have an anti-bacterial action. This explanation being quite satisfactory for transient immunity, there are other processes to be considered in permanent immunity. Voit's experiments in Buchner's laboratory have recently furnished the proof that the organism possesses in the living blood-plasma chemical properties of this kind, deleterious for bacteria. Living blood, generally, is an unfit alimentary substratum, but by a change of its quality it may just become a proper medium, and in this case, a *morbid affection* of the organism would take place ; the period of *incubation* would then be the time in which the blood is still possessed of those properties which arrest the bacteria in their growth or, possibly, even destroy them. Immunity, then, would represent a permanent power of the organism to maintain the period of incubation.

The question, in what way transition to actual morbidity is

prevented, is answered by Buchner, availing himself of the experimental results obtained by Chamberland and Roux, by the suggestion that it is the adaptation of the organism to the specific virus which makes the latter gradually lose its pathogenic properties. This very supposition of adaptation underlies protective inoculation, with attenuated specific fungi as well as with dissolved specific products of decomposition.

Buchner concludes his highly interesting expositions with the expression of a confident expectation that much of what, until now, is mere hypothesis, will soon be declared actual facts, having at the same time the value of practical progress. —*Munch. Mediz. Wochenschrift.*

THE AMERICAN MEDICAL EDITORS' ASSOCIATION.

THIS Association held its Annual Meeting in Newport, R. I., on the evening of June 23d, 1889, Dr. WILLIAM C. WILE, President, in the chair, which Dr. WILLIAM C. BRODIE, of Detroit, occupied during the Presidential Address on "OUR DUTIES AS JOURNALISTS AND THE REFORMS WE SHOULD PERSISTENTLY ADVOCATE." The promotion of medical education was its chief burden. It was logically presented, and the means of sustaining it by preliminary requirements, college curricula, and legislative action for the protection of the public health by the prohibition of quackery, were forcibly urged and illustrated by comparison with the higher standards of some foreign nations.

The duty of the nation to investigate preventable diseases and to prevent their introduction from abroad was next considered in relation with the diversion of the funds appropriated for the prevention of epidemics from the auspices of the National Board of Health to the Marine Hospital Service, which, he thinks, should no longer be permitted to exercise its unsuccessful attempts to carry on this important work. On reviewing the subject from various standpoints, he concludes that there is no better way of remedying the numerous evils and

shortcomings which complicate this service than by limiting the Marine Hospital Service to its legitimate sphere of taking care of sick mariners and establishing a national bureau or Department of Health as a distinct department, to which should be intrusted all the questions involved in the prevention of epidemic diseases and the administration of quarantine. And that such a work might be successfully conducted, it is important that instruction in sanitary science should occupy a larger place than it has hitherto in the curricula of all medical colleges. These subjects should occupy the foremost place with journalists who would direct the course of medical and public sentiment. As the official organ of the American Medical Association, *The Journal* should be improved in certain important features, positive and negative. It should divest itself of the needless details of puerile contributions, cases, and the proceedings of societies, and more strictly confine itself to the masters' sphere of a comprehensive digest of all that is new and useful, and at the same time possess such features as will render it attractive and popular.

The address was listened to with marked attention throughout, as an earnest of interest on the part of all upon whom the thoughtful sentiments of the president were urged. On its conclusion, there was a somewhat animated discussion, but little said to add force to the address.

Dr. BRODIE said he believed that *The Journal* of the American Medical Association should be conducted on a thoroughly impersonal plan, in which the identity of the editor is wholly lost to view. It had done much good work in killing off other journals of little value.

Dr. DULLES, of Philadelphia, said he believed it the duty of medical editors to foster good journals and kill the bad ones. He emphasized the necessity of maintaining a high ethical and literary standard and of promoting brotherhood in the profession.

Dr. LEARTUS CONNOR, of Detroit, believed that idealism in medical journalism does not pay. Some of the most wretched journals pay the best. He was reminded of the tobacco manufacturer, who said that if one would be rich he should pander to the *vices* of the people. He dwelt on the necessity of putting well-digested materials before the readers, but warned

his hearers against the danger of emasculating good articles by cutting them down.

Dr. I. N. LOVE, of St. Louis, believed that Darwin's law holds good in journalism as in animal life.

Dr. N. S. DAVIS, of Chicago, in his most vigorous manner rebuked the patronizing of foreign schools to the neglect of our own, and asserted that one fourth of the money expended by our students in foreign countries would serve to perfect our own valuable institutions.

Dr. PANCOAST, of Philadelphia, deplored the failure to report the daily work of the clinics. The weekly journal should be a mirror of the medical and surgical work done in the clinics of each community. We look to the journal for the knowledge we need in our daily work.

Dr. WAUGH, of Philadelphia, found little in what had been said during the discussion with which he could agree. What is ideal reading for one cannot be ideal for all. As for special journals, there are not specialists enough to support them, whereas culled special matter may well enliven the columns of a general journal.

Dr. STORER, of Newport, found much satisfaction in the thought that the plan which he indorsed eighteen years ago, of founding a weekly journal as the organ of the American Medical Association, had met with such great success.

THE OFFICERS-ELECT OF THE AMERICAN MEDICAL EDITOR'S ASSOCIATION for the ensuing year are as follows :

President, I. N. Love, of St. Louis ; Vice-President, C. W. Dulles, of Philadelphia ; Secretary, J. L. Gray, of Chicago.

The next place of meeting, Nashville, Tenn.

THE INTERNATIONAL MEDICO-LEGAL CONGRESS, held in New York, June 4th–7th, 1889, under the auspices of the New York Medico-Legal Society, in fruitfulness of material was successful beyond the most sanguine expectations of its promoters. It perfected a permanent organization and provided for the selection of an additional Vice-President from each State and Territory of the American Union, and from each foreign province, state and country who had members in the organization that took an interest in the success of the movement.

Future meetings were authorized to be called by the Executive Officers.

The expenses of publishing all the papers read at this Congress, with a record of its transactions and the proceedings at the banquet will fill a large volume, the expense of which is estimated will be about $700. The Executive Officers were authorized to elect additional members into the organization, the only expense of which is the enrolling fee of $3, which entitles the member to the *Bulletin* free.

The officers elected by the Congress were:

Clark Bell, Esq., of New York, President. Chief Justice Sir John C. Allen, of New Brunswick; Chief Justice Edward F. Bermudez, of Louisiana; Dr. Bettincourt Rodrigues, of Portugal; Governor Biggs, of Delaware; Dr. Daniel Clark, of Toronto, Can.; ex-Chief Justice Noah Davis, of New York; Dr. Edward J. Doering, of Illinois; Professor John J. Elwell, of Ohio; Judge W. H. Francis, of Dakota Territory; Dr. W. W. Godding, of Washington, D. C.; Dr. Eugene Grissom, of North Carolina; Dr. Carl H. Horsch, of New Hampshire; Judge Locke E. Houston, of Mississippi; Dr. Charles H. Hughes, of Missouri; Dr. W. W. Ireland, of Scotland; Professor Robert C. Kedzie, of Michigan; Dr. Norman Kerr, of England; Dr. Jules Morel, of Belgium; Dr. Jennie McCowen, of Iowa; Dr. Connolly Norman, of Ireland; Professor John J. Reese, of Pennsylvania; Judge H. M. Somerville, of Alabama; David Stewart, Esq., of Maryland; Theodore H. Tyndale, Esq., of Massachusetts, Vice-Presidents. Moritz Ellinger, Esq., of New York, Secretary. Frank H. Ingram, M.D., of New York; William J. Lewis, M.D., of Connecticut; J. F. Walters, of New York, Assistant Secretaries.

The President was empowered and directed by the Congress to appoint additional Vice-Presidents for the various States, Territories, provinces and countries, which will be done during the summer vacation. Members of the Congress who have not sent their enrolling fee, are requested to do so, to CLARK BELL, President, 57 Broadway, New York, or MORITZ ELLINGER, Secretary, Surrogate's Office, New York.

THE PREVENTIVE SIDE OF MEDICINE.*

By F. BAGSHAWE, M.D.

IN treating of the great question of sanitation, we may consider health either as it affects the individual, or society as a whole. The former more particularly concerns the medical man, the latter the public guardians of health, whether medical or non-medical. It is of the first—viz., of personal family health, that I propose specially, though not exclusively, to speak in the present paper. It is clear that the improved health of the units of the Society must have a marked effect on the whole sum, but it is also clear that unless the whole sum be properly controlled and guided, the units—that is, the individuals—must suffer, despite the utmost care these may exercise. For an individual must first put himself, his family, and his dwelling into the fittest possible condition to defy disease, and yet suffer from the careless or improper sanitary supervision of the town or district in which he lives. Two measures are necessary that the health of the country may be duly provided for: 1. That the individual citizen should adopt every known means to insure his own health and the health of his family; 2. That the ruling authorities should make use of every means the science affords to prevent the outbreak of sickness. Could these measures be effected, Disease—that hydra whose poison tooth heads have been multiplying in all directions since the birth of civilization—would have found its Hercules to fire the decapitated stumps of evil, and at last reduce the monster to dimensions as small as contained him in early times. For as the growth of Society, so has been the growth of disease; and meanwhile medicine slept, only waking up at such times as the new poison heads came forth, and seldom, or never, using the sword to cut off the deadly offspring. Now it has awakened to its most important duty—prevention. Already sickness is reduced. Some of its worst forms are already almost extinct, and the conflict with

* Abstract of paper read before the Health Congress of Hastings, England, April 25th, 1889.

others is seen to be hopeful. . . . With man's inborn tendency to gregariousness, resulting in the growth of village, town, and great city existence, began the history of his health troubles, and the necessity, first for the curative medicine, which was doubtless soon recognized ; far more of preventive medicine, which has only been fully acknowledged at this late stage of the world's course, and when misery and suffering have taught their lesson. To take the death-rate of London, it was, in the seventeenth century, 80 per 1000, 50 in the eighteenth, and 24 in the present day. Our own town is, at the present time, 13 per 1000. The improvements already achieved are, however, small indeed compared to what might be done if a thorough system of sanitation were enforced by Government, and carried out rigidly, without favor to individuals and under really efficient officers. Whether this ever will be done in a country which resists the wisest measures for its own health and safety on the shallow ground of sentiment, or the equally shallow one of liberty of the subject, is rather doubtful. The individual health branch of our subject more especially concerns the ordinary practitioner, and how far disease can be prevented by attention to individual health and the healthy surroundings of the individual is, or should be, the first care of every physician. Too much stress cannot be laid on the proper training of man for the race of life, and the problem involves two great conditions : care for the individual himself, and for the house he lives in ; neither is sufficient alone ; together they are complete, always supposing that the condition of the surrounding district does not interfere to spoil the work. First, then, as to the individual himself. The necessities for health may roughly be summed up in diet, clothing, bathing, and exercise, voluntary abstinence from vicious causes of harm to health being, of course, understood. Simple and regular diet cannot be too strongly preached. Rich food and irregular meals, together with too little bodily and too much brain exercise, have produced that potent disorder called nervous dyspepsia. Fortunately we in England are an active race, and love to spend our energies in sport, and the increasing tendency to athletic pursuits helps to counteract that toward nervous and digestive disorders, themselves the result of sedentary habits. The athletic tendency

of the race, though it may be harmful to certain individuals, is of undoubted national good, both morally and physically. Clothing in this climate resolves itself into the choice of wool, for woollen underclothing is most important. There can be no question that the wearing of pure woollen clothes in place of linen is the best of all preservatives from cold, with all its harmful and fatal consequences. Bathing, again, is a valuable aid to health. What is called the morning tub—cold or tepid, according to season, and individual power of reaction—is a most useful tonic. With proper attention to diet, clothing, bathing, and exercise, a man should win half the battle for health. But then comes the other half of the problem—the house he lives in, and its surroundings. These mainly comprise soil, air, water, ventilation, and drainage. The first three of these are not always within our power to choose. Every one cannot live in Hastings or Torquay, or Tunbridge Wells, or Malvern, on the hill in preference to the plain, or on the gravel soil instead of a clay one. Ventilation of the rooms we live in is all important to health, but drainage, the most important of all, should be our first care, both before choosing a house and settling in it. An efficient system of drain-pipes and drain ventilation, with periodic inspection by a sanitary expert, would insure the prevention of much disease. And here we come to that great question of the day, which has already made its march on our generation, and which is making that march deeper and wider every year, the best and brightest side of the science of medicine, the

PREVENTION OF DISEASE.

After speaking of the extinction of the deadly jail-fever and the stopping of typhoid-fever in various places by a good system of drainage, the reader went on to say: My friend, Mr. Gabb, bears similar testimony with regard to Hastings. He remarks that in 1857 we had a very dry spring and summer, and then occurred a most serious epidemic of typhoid. This was in the days of cesspools, before the main drainage scheme had been carried out, or an efficient supply of water provided. In some streets of the Old Town not many houses escaped without one or more of their number being stricken. "I had," he says, "on my list *at once* thirty-seven cases in vari-

ous stages of the complaint. Soon after the drainage was carried out, and, I believe, completed in the following year, when a wonderful improvement took place in the sanitary condition of the borough, and typhoid greatly diminished. Some ten years later further improvements were made in the ventilation of the drains. Since then typhoid has almost disappeared, if exception be made of a local outbreak some ten years back, from a cause that was at once appreciated and removed. I say almost disappeared, because a case is occasionally imported into the town. The well-known outbreaks of this disease at Guildford in 1867, and at Lewes in 1874, were all traceable to the leakage of sewage into the water supply. The advantages to be derived from a careful system of prevention in scarlet-fever have been well known in our town. It is now many years—in 1871—since efforts were made in this borough toward the systematic isolation of cases of scarlatina, and they were at first carried on by private enterprise. An enthusiastic

LADY SANITARIAN,

Mrs. Johnstone, seeing that the use of disinfectants and the isolation of patients with their attendants were potent means to arrest the spread of this disease, made it her business to search out cases of scarlatina whenever she could hear of them. She would call on the householders, whether rich or poor, and explain to them in great detail her views. She would exhort them to isolate the sick member completely, explain the methods of disinfecting all secretion, of putting up the carbolized sheet before the door, and point out the importance of cutting off all communication between the sick person and his attendant from the rest of the house. She made provision for the disinfection of linen before going to the laundress, and recommended where it could be sent with safety. She secured the removal of the infected or doubtful children from the day schools. She persuaded the needlewomen and tailors inhabiting infected houses to desist from taking in work, and these measures she took at the expense of offering subsidies to parents or workers who would thus be temporarily thrown out of employ. Finding the impossibility of isolating by these means alone, with the help of a number of ladies and gentlemen

whom she interested in the work, she took rooms to serve the purpose of a temporary infectious hospital. By degrees she thus formed the Sanitary Aid Association, consisting of a number of annual subscribers, and a large and influential committee of clergymen and others, with herself as manageress, and with nurses as assistants. The latter she thoroughly indoctrinated with her practical views. An important work was thus inaugurated in the borough, which, in spite of much opposition and conflict, was destined to bear important fruit. An Act of Parliament exists, authorizing the sanitary authorities to provide hospital accommodation for infectious disease. It was not long before the Town Council found it expedient to start their own hospital for isolation, and this part of the work soon passed out of the hands of the Sanitary Aid Association. But work still remained for the volunteers. Their nurses still continued to visit infected houses, and to advise and help quietly and practically, when the visit of the Inspector of Nuisances would have been regarded as an intrusion, and thus, by their quiet and ready help, formed a valuable auxiliary in carrying out the instructions of the doctor in charge of the case. Moreover, the funds of the Association were available for tiding over a crisis in the family, where without them it would have been impossible to prevent the bread-winners from carrying on their employments at the risk of spreading infection far and wide. One exceptional immunity from serious outbreaks of scarlatina has doubtless been, in no small degree, the fruit of this organization. The Sanitary Aid Association has been the parent of many similar institutions in different parts of the kingdom, of which I may quote Westminster as an example. A senior practitioner in this town tells me that the scarlet-fever of the present day is a vastly different disease in its severity to what he was accustomed to see in his early days. The cases which arise in the town are mild, the disease being most often imported from a distance, and even these are generally not of a malignant character. This altered type is largely due to the improved drainage. Outside the fevers there are other ailments more slowly, but not less surely affecting health and life, some of which are easy, some not so easy of prevention. Among

OUR DOMESTIC SERVANTS

want of ventilation is prolific of this disease, if not of consumption at least of that too common condition, anæmia or bloodlessness, which itself begets a brood of definite ailments. The fact that our domestic servant girls so frequently suffer from an anæmic condition is a terrible witness to the thoughtless unconcern of their employers in not providing them with proper food, sufficient outdoor exercise, and pure air. Not alone are bedrooms close and narrow, but basements add to these evils dirt and bad lighting, while ventilation is almost disregarded. The heat of the modern underground kitchen is raised to an extreme degree by the enclosed kitchener, or, still worse, American oven inventions, which, by raising the temperature and stopping up and intercepting that natural ventilator—the open chimney—have done much to foster ill-health. Further, it is the custom to erect gas heating and cooking arrangements, without providing the smallest pretence of ventilation to carry off the fumes. This practice cannot be too strongly condemned. If the inhalation of gas products does not produce giddiness and insensibility (and I have known it to do even this in a small airless bath-room, where the water was heated by gas), it will certainly add to a form of ill-health of which anæmia is the first outcome. Hence it comes that our "convalescent homes," our "houses of rest," and even our hospitals become populated with pale, spiritless faces and languid forms which bear eloquent testimony to want of sanitary precaution. In our own Hospital of Hastings, I had under my care alone in the out-patient department last year no less than forty-one cases of anæmia out of two hundred and fifty-seven patients, a ratio of more than one seventh, which surely is deeply significant in so healthful a locality. Anæmia, however, is not a complaint of women only, though it is more common with them. Men employed in ill-ventilated and ill-lighted shops or factories suffer from the same condition. But our young men—at all events those in the better shops in country towns—have one advantage over their sisters in employment—they have their bicycle or rowing club, or some inducement to athletic exercise after the day's confinement, promoting health and healthful sleep, and vigor of body and

appetite. The young women are often too tired to do more than go home, perhaps to a room and atmosphere not much better than they have left. Apart from good food and exercise, which are not so easy to deal with, light and air are the two essentials to the health of the employed, whether servants or shop assistants, and these ought to be insisted upon, for the absence of them is almost as harmful as bad drainage or fouled water. Of all diseases, or tendencies to disease, the inherited is the most difficult to oppose. For legislation can only lay the least of its fingers on them ; and as passion is stronger than reason in most men, it will be long before individuals can be reckoned on to do the work themselves—probably never. Certain it is that,

FAMILY OR HEREDITARY PREDISPOSITION

holds a leading place in the induction of phthisis, but obedience to the laws of health might do much to disinherit it in the course of generations. Yet it must be allowed that, in proportion as the knowledge of the more direct causes, previously overlooked, becomes more extended, so does the estimation of heredity shrink in importance ; for, in proportion as damp and dust, and unwholesome emanation, and insufficient or improper food, are recognized among the active general causes, and as local injuries, offering impediment to the action of the lungs, such as pleurisy, inflammation, and tight lacing and the like, take their proper place as local causes, so does hereditary taint sink in the reputed scale of causation. The Doctors Williams point out that, while forty-eight per cent has been shown to be the number of hospital cases which give a history of heredity among the lower classes, and while the records of Brompton Hospital give a percentage of twenty-five, yet that records of their practice give a percentage of only twelve. They say the only explanation we can offer of the discrepancy is the difference in the classes of the patients on which our statistics are based from those on which other authorities are based. They add it is likely that our small percentage in a class from which its wealth is able to banish many of its most fertile causes of phthisis, gives a most just estimate of the influence that hereditary predisposition, unaided by poverty and exposure to divers pernicious influences,

exercises in the causation of phthisis. Niemeyer and other authors, both English and German, deny that consumption is hereditary as a specific contagion, while they allow that the tendency is inherited. Whether this be so or not, at least we know that weakening constitutional diseases in the parent, such as gout or asthma, or excessive indulgence in alcohol or the like, may render the next and succeeding generations prone to the disease.

Slowly and laboriously have we been arriving at the conclusion that uncleanliness, overcrowding, foul devitalized air, damp, and dust, have been active promoters of disease. Take, for instance, the strange mortality in our army years ago from pulmonary affections; while deaths from consumption of the same age in civil life were 6.3 per 1000, they amounted in the cavalry to 7.3, in the infantry of the Line to 10.2, and in the picked men of the Guards to 13.8. Stranger still, it was found that the troops hutted before Sebastopol in 1856 suffered a far lower mortality than those barracked at home. The pith of these startling figures lies in the fact that after the system was changed, with free ventilation established in the barracks, and sufficient breathing space provided for each individual, the tables were turned, and our soldiers no longer appear to disadvantage, but the reverse, in comparison to civilians. Again, both Dr. Bowditch and Dr. Buchanan showed independently the extreme importance of dampness of the soil as the cause of consumption. The former says: "A resident on or near a damp soil, whether that dampness is inherent in the soil itself, or caused by percolation from adjacent ponds, from marshes and spongy soils, is one of the primal causes of consumption in Massachusetts, probably in New England, and possibly in other portions of the globe." Again, it was shown that the death-rate from consumption in the city of Salisbury was reduced by nearly one half, in consequence of its subsoil drainage. Injurious dusts and atmospheres incident but not necessary to certain manufactures can be prevented, and legislation has done something, but should do more, to make such prevention absolute. Past statistics, and even some present ones, tell a terrible tale of shortened lives and ruined health under these conditions. Only recently, in some lectures by Dr. Arledge (reported in the medical journals), the

fatal tendency to pulmonary disease is pointed out among workers on our silk, cotton, woollen, flax, and similar manufactures, as well as in other fields of labor, such as wood and ivory-turning, bronze-casting, and so forth. In addition to the injurious effects of the dust or filaments, the air of the work-rooms is often kept at a high temperature, and sometimes, notably in the cotton sizing sheds, is damp, also producing languor, loss of appetite, dyspepsia, and anæmia. Out of sixteen hundred and forty-two out-patients treated at Macclesfield Infirmary, of whom nine hundred and twenty-two were engaged in the silk trade, respiratory diseases constituted about one fourth of the complaints treated. The inferior cotton, Dr. Arledge points out, requires most sizing, and to secure the requisite heat or moisture no external air is admitted, while jets of steam are let into the sheds, saturating walls, ceiling, and the clothes of the work-people. No wonder, he adds, that the operatives complain of debility, sweating prostration, fainting, and impaired digestion. And may we add that it is no wonder he invites legislative interference to prevent the carelessness of manufacturers, thus sacrificing the artisans? In dressing the linen web a similar high temperature prevails, and this process is so unhealthful that only a few adult men free from chest disease are chosen, yet the average duration of employment, even of these, is only sixteen years. What prevention can do is shown in the case of Leek, where the mortality from consumption, as in other silk towns, was notoriously high, but is now happily as strikingly reduced since proper ventilation was established in the mills, unhealthful mills rebuilt, and the artisans provided with improved, well-drained dwellings. During the condition of lowered vitality, from whatever cause, the body becomes specially vulnerable to attack. The soil has lost its richness, and with it the power to grow good seed, but weeds grow apace. The germs of tubercle must be widely spread among us, but for them to fructify they must have an impoverished soil, and be sown with a sufficiently lavish hand, otherwise they will fall harmless and sterile on their bed. In conclusion, he says: What is to be hoped for, and what can be done, is that with our accumulated knowledge and experience, and with the weapons science has placed in our hands, we may at least keep the

enemy, Disease, at a respectful distance, by making our individual lives and homes as healthful as we have now the means of doing, and by such wise legislative provisions for the great sum of life, the good and evil of which must affect the individual units, as shall serve to secure the health, and so the happiness of mankind.

MICROBIC LONGEVITY : SCARLET-FEVER.—Thirty-five years ago an opulent family lived in a palatial home in one of our most beautiful suburbs. Two lovely children graced the happy household. But scarlet-fever, that fell foe of childhood, closed their eyes in death. The grief-stricken mother gathered up little slips, slippers, and toys with two golden tresses, and reverently laid them away in a trunk as sad but priceless mementoes of her lost darlings.

War came with its tragic vicissitudes, and death time and again threw its shadow over the hearthstone.

Finally the place passed into stranger hands. Last year two families took it as a summer residence.

The children, six in number, with childish curiosity, began to explore the secret recesses of the grand old house. In a closet was found the forgotten trunk. A touch dissolved the time-corroded clasp, and one by one the sacred relics were removed, until a faded newspaper was found, which told the pathetic story. Half-spelling out the meaning, they took it to their mother, who chided their curiosity, and tenderly replaced the treasures.

Five days after this occurrence two of the children were seized with scarlet-fever, and forty-eight hours later the other four were attacked.

Two cases were grave, the others mild. All recovered. Was the disease contracted from the trunk? I think so, because there was no other ascertainable source of infection.

Moral : Silks, woollen, and hair, being good fomites, should not be put away in air-tight trunks as mementoes of friends dying with infectious diseases, because they may become, at some remote period, the starting-point of a wide-spreading and a disastrous epidemic, a calamity which was averted in this instance only by complete isolation.—*Professor T. A. Atchison, M.D., Nashville Journal of Medicine and Surgery.*

EDITOR'S TABLE.

THE HEALTH CONGRESS AND EXHIBIT at Hastings, England, April 23d–25th, 1889, appears to have been one of the most successful events of the kind that has ever hitherto been held. From an editorial sketch of the Congress and description of the Exhibit in the *Hastings and St. Leonard's Observer*, through which we have been kindly furnished with a full report of the proceedings, on the day of the opening from about 9 o'clock in the morning to the set time, 2.30 P.M., there seemed to be one continuous stream of human beings backward and forward to the Brassey Institute and grounds where the exhibitors were hurrying their work to be ready for the opening ceremonies in the good, old-fashioned English mode of a *luncheon* given to the officers and distinguished guests by the Mayor in honor of the occasion.

Of the papers read—from which we have made liberal abstracts, beginning with that of Dr. B. W. Richardson, President of the Congress, in July number, those of this number and of others to follow—it is safe to say, that neither in the choice of subjects nor the ability with which the subjects are discussed by their authors, have they ever been excelled in relative significance or cogency to their purpose—the enlightenment of the public on practical measures for the prevention of disease.

The Sanitary Exhibit was alike creditable and remarkable for the extent and excellence of its display of "everything" illustrative of applicable knowledge in the promotion of the object. Of it the President, Dr. Richardson, who, it might go without saying, has seen all previous exhibits of the kind, said at the opening: They had to go back to the first days of modern sanitation to understand what was meant by exhibits like those they saw around them. There was one man sitting before them at that meeting, the oldest man in the Assembly, whose name was much revered throughout the country; he referred to Sir Edwin Chadwick (applause), who could go back a quarter of a century before him (Dr. Richard-

son) in the matter of sanitary reform. The sanitary movement began with small things, and grew gradually before it attracted the attention of the people of the country. People, in the beginning of the movement, did not think of exhibitions. Attention then was only devoted to principles, and when laid down without anything to attract the attention of the public at large, became a mere abstraction of little use. It was most important to place sanitation clearly before the people and it was necessary to make the influence felt at the home ; and when they established health there, it was everywhere. (Applause.) He had taken but a hasty glance around, but he would say, at the first glance, that it was the best Exhibition of the kind he had yet seen opened. (Applause.) He was quite sure they would all feel that a great amount of credit attached to his Worship the Mayor (applause), to the energetic manager, Mr. Caygell, and to the Committee. The Exhibition was a credit to the town of Hastings as a health resort. (Applause.)

Sir Edwin Chadwick, who was heartily received, said one inducement for coming, besides reading his own paper on "Death-rate and the Census," was to see the opening of what he considered a great sanitary factor—the power of washing cheaply with tepid water. The German army, he might mention, was the lowest death-rated of any in Europe, being only about five in a thousand, while our army was eight, France ten, and Italy eleven. One means of this was the factor of washing with tepid water. That he had shown in England was the great means of the reduction of the children's diseases in the district schools. In Germany half a million of soldiers were being washed with tepid water at the cost of about 6d. a hundred, soap included. He expected that when the Exhibition opened they would be able to display a power of washing children with tepid water at the rate of a working expense of not above 1d. for a dozen, and they would accomplish it at the rate of a little more than three minutes for each child. He had long shown elsewhere that pigs that were washed put on one-fifth more flesh than the pigs that were unwashed, and more than this was the result with children. At all events, it was by the operation of this factor with others, notably ventilation, that the children's diseases in the district schools had

been got rid of, and he believed the same result would be found practicable under sanitary arrangements here in Hastings. This might be made an exemplary place for the safety of children in schools from children's epidemics. But added to the power of washing was what he was told would not be able to be exhibited there—the power of ventilation, chiefly by the invention of Maxim, the great gun improver of America—ventilation with warm air in winter, or cool in summer. The death-rate among school teachers was no less than twenty in one thousand—that was to say more than four times the death-rate in the Royal Navy. He believed that death-rate was reducible immensely by this method of ventilation. At present filthy-skinned children were massed together under conditions that were productive of children's diseases, and equally or more injurious to the teachers themselves, and he believed that these evils were possible of reduction in Hastings. He hoped the mayors and representatives of other boroughs would give attention to this power of washing for cleansing the population, and not only cleansing them, but staying epidemics. (Applause.)

WILL BROOKLYN, in October next, emulate HASTINGS? Hastings is an English town of 55,119 inhabitants, and on the evidence just above cited, it has excelled all other towns and cities hitherto in the application and display of object lessons in the most desirable of all knowledge pertaining to this world—the means of promoting health and protecting life.

TO PUNISH DRUNKARDS.—The Legislature of Minnesota at its late session, apparently realizing the failure of its High-License enactment of a few years ago, ostensibly for the prevention of drunkenness, but in reality authorizing the means by which it may be privileged, passed a law to punish drunkards. The new law provides a fine of not less than $10, nor more than $30, or by imprisonment for not less than ten, nor more than forty days. For the second offence, by imprisonment for not less than thirty, nor more than sixty days, or by a fine of not less than $20, nor more than $50. For the third or all subsequent offences, by imprisonment for not less than sixty days nor more than ninety days.

It is to be hoped that this law will be vigorously enforced.

THE SANITARIAN has constantly maintained that the true criminal is he who gets drunk. And that it is no more reasonable to hold the liquor-seller guilty of promoting drunkenness than it would be to hold the grocer guilty of promoting theft because his goods are sometimes stolen. Make drunkards odious and cease pampering them as unfortunates and encouraging them to hold other persons responsible for their sins, and getting drunk will speedily go out of fashion.

THE PROGRESS OF INFECTIOUS DISEASES AND MORTALITY RATES AT THE MOST RECENT DATES, BASED UPON OFFICIAL AND OTHER AUTHENTIC REPORTS.

ALABAMA.—*Mobile*, 40,000 : Reports 76 deaths during June, of which 27 were under five years of age. Annual death-rate, 22.8 per 1000. From zymotic diseases, 19, and from consumption, 12.

CALIFORNIA.—For the month of June, 1889, the Secretary's abstract of the reports received from 80 cities and towns, with an aggregate population of 728,700, the number of deaths was 854. Annual rate, 14.04. Deaths from consumption during the month, 139. From zymotic diseases : Diphtheria and croup, 32 ; typhoid-fever, 31 ; typho-malarial-fever, 1 ; cerebro-spinal-fever, 6 ; diarrhœal diseases, 55 ; whooping-cough, 3 ; scarlatina, 5.

San Francisco, 300,000 : During the month of June the number of deaths was 398. From zymotic diseases, 34. From consumption, 76.

Los Angeles, 80,000 : 63 ; from zymotic diseases, 17 ; consumption, 10.

Oakland, 55,000 : 63 ; from zymotic diseases, 19 ; consumption, 6.

San Diego, 32,000 : 13 ; from zymotic diseases, 6.

Sacramento, 35,000 : 30 ; from zymotic diseases, 6 ; consumption, 1.

CONNECTICUT.—The Secretary reports for June, 1889, 925 deaths from 167 towns, comprising a population of 756,722, representing an annual death-rate of 14.6. Deaths under five

years of age, 262. Deaths from zymotic diseases, 187. From consumption, 130.

New Haven, 85,000: total deaths, 137. From zymotic diseases, 40; consumption, 19.

Hartford, 52,000: total deaths, 90. From zymotic diseases, 31; consumption, 17.

Bridgeport, 46,000: total deaths, 64. From zymotic diseases, 13; consumption, 9.

Waterbury, 34,000: total deaths, 38. From zymotic diseases, 10; consumption, 6.

DISTRICT OF COLUMBIA.—Total deaths during five weeks ending June 29th, 529, of which 251 were under five years of age. There were 255 deaths in the colored population. Annual death-rate, white, 19.09; colored, 35.36; total population, 24.44. Zymotic diseases caused 146 deaths and consumption, 62.

FLORIDA.—The Report of the Jacksonville Auxiliary Sanitary Association, covering the work of the Association during the yellow-fever epidemic of 1888, edited by the Secretary, Charles S. Adams, of Jacksonville, Fla., a pamphlet of three hundred and forty pages, comprises a concise, yet full statement of the circumstances and facts related to the occasion which lead to the formation of the Association, the exercise of its functions and to the use of funds placed at its disposal. The Association would have it borne in mind that, besides the sick, there was a population of some 16,000 other persons left in the city, 14,000 of whom were without resources and without employment, by reason of the demoralization of business and the flight of employers, and that this population had to be provided for.

Preceding the general detail of the report there is a chronological summary of news items, beginning with the first case of yellow-fever in the city, July 28th, the speedy recurrence of other cases, and the widespread alarm thereby created.

The permanent organization of the Association was effected August 13th.

The number of deaths from yellow-fever recorded in the report is 427. "The percentage of deaths, according to the

published bulletins, was about $9\frac{1}{6}$ per cent, and was unusually small." This result is attributed, in a great measure, to the mildness of the fever, the care of the sick, including daily inspection of the houses, etc.

By the special report of the Committee on Census and Depopulation, taken in connection with the uncertainties of the report on refuge camps, the effort at depopulation was a signal failure. Moreover, notwithstanding the house to house inspection and the painstaking subdivision of the city into districts, with a view to definite information regarding the population remaining and cared for by the Association, there is a good deal of uncertainty—possibly unavoidable, considering the nature of the population and its determined reliance upon the Association whether sick or not. We are gratified with knowledge from other sources that many of such persons were made to earn their food by digging ditches and do other useful work promotive of sanitation.

Contributions sum up in cash $331,922.63 ; donations and supplies, $13,467.50. To this membership fees of the Association are added, and all accounted for by itemized disbursements, amounting in the aggregate to $481,395.45 and a balance of $24,752.84.

Pensacola, 15,000 : Reports for five weeks ending June 29th, 21 deaths, of which 9 were under five years of age. Annual death-rate, 14.57 per 1000. There were 10 deaths from zymotic diseases.

ILLINOIS.—*Chicago :* Health Commissioner Dr. Oscar C. De Wolf reports, for the *year* 1888, the general sanitary condition of the city satisfactory. Population estimated at 830,000 ; deaths 15,772—7533 of children under five years of age, 15 less than during the previous year. Of this large proportion the Commissioner remarks :

" When it is remembered that the population of Chicago is distinctive among all large American cities for the great proportion of children under five years of age, it will not appear to our disadvantage. As compared with 31 cities having populations of over 35,000—the aggregate population of which, by the census of 1880, was 6,603,414—Chicago has over 15 per cent of children under five years of age more than the average of the whole number ; and this large proportion-

ate excess of the child class increases our total mortality rate, which, notwithstanding this fact, has only risen to 19 per 1000 of our population, which includes all deaths by accident occurring within our limits."

The only disease which appears to have been persistently epidemic throughout the year was diphtheria. From it (and croup) the number of deaths was 1297. Its greatest monthly mortality was in November, 136; smallest in June, 59.

Calling diphtheria a "filth disease," the Commissioner thinks has had the effect of diverting attention from its actively contagious character, and the importance of seclusion and disinfection, which should be with the same energy as that observed in the management of small-pox.

Deaths from other zymotic diseases 2655; of these there were from diarrhœal diseases, 1362; typhoid-fever, 375; scarlet-fever, 184; whooping-cough, 183; measles, 151; cerebro-spinal-fever, 138; malarial-fever, 96; erysipelas, 86. Fourteen hundred and twenty-six, or 9.04 per cent of the total number from all causes were caused by phthisis pulmonalis; by other diseases of the respiratory organs, 2323.

The question of the effectual disposal of garbage seems to be well-nigh disposed of in the practical operation of three crematories reported upon. The "Engle," which is in satisfactory operation at Des Moines, Ia., is said to be more economical than any other; the "Mann," which was favorably reported upon by Assistant Health Commissioner Thompson a year ago, and has been in successful operation in Chicago since March 6th, 1888, and the "Merz," which is now in process of construction. This last is particularly commended by Commissioner De Wolf on account of its economical advantages, it not being a destructor, like the other two, but a rendering apparatus, by which a useful oil is extracted and the residue rendered into manure—and all without offence.

Assistant Commissioner Thompson, in concluding his special report upon the subject, wisely remarks that:

"It is a matter of great importance to the cities of this country to determine the relative merits of these inventions, and in order that this may be intelligently done, those in authority should entertain clearly the qualities which they must necessarily possess for the fulfilment of the wants of the local-

ity in which they are to be erected. A furnace moderate in its cost of construction, economical in its needs of fuel, demanding a minimum of labor in its conduct, adapted to the varieties of waste material to be consumed, with freedom from nuisance in the way of excess of smoke, the disposition of refuse and the absence of any offensive odor from combustion, and offering a product which will at a small cost of handling prove remunerative, is the character of a furnace all cities are looking for to-day. Such a one we hope to see in operation in this city at no distant day."

For the month of June the Commissioner of Health reports: Total number of deaths 1032, of which 470 were under five years of age. Annual death-rate, 14.92 per 1000. From zymotic diseases there were 224 deaths, and from consumption, 101.

Sanitarians generally will regret to learn that Dr. De Wolf has resigned the office of Health Commissioner of Chicago, which he has ably filled for thirteen years. Few cities in the country have presented more difficulties in the way of successful sanitary administration than Chicago. But they have been met with rare skill, and the healthfulness of Chicago to-day ranks among the foremost of large cities. His successor, Dr. Swayne Wickersham, has his reputation to make as a practical sanitarian, but he is the heir to an efficient organization and, presumably, to a corps of well-trained subordinates. His efficiency will depend no less upon his aptitude for clearly comprehending the scope of his duties than his executive skill; he has in both an admirable example to emulate.

IOWA.—*Des Moines:* For the month of June, consumption, 1; pneumonia, 2; typhoid-fever, 1; diphtheria, 1; membranous croup, 1; measles, 1. Total deaths, 34. Annual death-rate per 1000, 5.88.

Keokuk: Consumption, 4; cerebro-spinal meningitis, 1. Total deaths, 15. Annual death-rate, 11.28.

Dubuque: Consumption, 5; pneumonia, 1. Total deaths, 24. Annual death-rate, 8.22.

Davenport: Diphtheria, 10; diphtheritic croup, 2; membranous croup, 1; consumption, 3; pneumonia, 1. Total deaths, 45. Annual death-rate, 12.24.

KENTUCKY.—The State Board of Health held its regular annual meeting at Louisville, May 7th, 1889.

The chief subject of consideration was typhoid-fever, more or less prevalent throughout the State in consequence of polluted water.

The subject was forcibly presented in the annual address by the President, Dr. Pinckney Thompson, and the Secretary was directed to prepare, and have distributed through the local boards of health, twenty thousand circulars calling the attention of the people to the importance of protecting their springs and wells from the seepage of privy vaults and other sources of pollution.

An unusual fatal epidemic of cerebro-spinal meningitis, but fortunately of limited area, prevailed early in the year, in Webster County, embracing "the flats on either side of Crab Orchard Creek, following the meanderings of this poisoned stream for a distance of seven miles, and reaching out its infectious arms to the hills, a mile or more on either side," occupied by about one hundred and forty families, of all conditions. About half of those families, without regard to immediate surroundings, were afflicted. There had been, up to the time of the report, by W. A. Quinn, M.D., Sanitary Inspector, March 4th, about seventy-five cases, with fifty deaths. The first case occurred January 1st; other cases rapidly followed in the neighborhood, in no way exposed to one another, but all subject to the influence of poisonous effluvia emanating from a soil saturated with vegetable matter in process of decay and leaching into the foul creeks from which the drinking-water was obtained.

The disease appears to have continued, though less prevalently up to the time of the meeting of the Board. Isolation and depopulation had been advised by the President, as, in his opinion, the safest course for the people, with a view to the subsequent *treatment of the place*, notwithstanding the weight of professional opinion against the contagiousness of the disease.

Rules with regard to quarantine in the event of yellow-fever, and for the transportation of infectious diseases' dead, formulated by the Secretary, were indorsed, and the Board adjourned without delay.

LOUISIANA.—*New Orleans*, 254,000: During the five weeks ending June 29th there were 635 deaths, of which 239 were colored. There were 215 deaths under five years of age. Annual death-rate per 1000, whites, 22.37; colored, 35.58; total population, 26.29.

At the regular meeting of the Board of Health for the month Dr. Blanc, the chief Sanitary Inspector, reported that though no special disease prevailed there were 86 deaths from bowel diseases. From diphtheria there were 16, 8 white and 8 colored, a notable increase in the proportion of the colored, which has hitherto been much smaller. The Inspector remarked that, during the month, and in fact for some time past, considerable trouble had been experienced in causing issues from vaults in street gutters to be closed according to law and proper sanitary requirements. It is evident that the laws of common sense and common decency require that vaults containing fæcal matter shall not be allowed to empty their contents into the open street gutters; the practice of emptying urinals into the gutters is only tolerated because of the absence of any other practical plan of disposal. These illegally constructed vaults are, for the most part, in the business portion of the city, where offices abound, and human beings are crowded together for a time in one building. Several of these nuisances have already been abated, with considerable trouble, owing to an astonishing and surprising ignorance of the law on the part of architects, builders, and plumbers.

On the suggestion of the Inspector a resolution was adopted by the Board, making it the special duty of inspectors to enforce the law in reference to the issues from vaults into streets and gutters.

MAINE.—*The Sanitary Inspector* reports: "The Secretary of the local Board of Health of one of our towns writes for advice on the following statement:

"'Our city, as a rule, has no system of sewerage except what nature and natural brooks have made. Nearly all sink and many privy drains open on one side of the street (in the gutter) either opposite to, or some little distance from the houses, making, especially where several unite under one sidewalk or

by one road-side, a very unsanitary condition. The question with us is, Who is responsible for these several drains after they enter the street ditch? Is each individual householder obliged (as our aldermen claim) to carry his drain to the river (a distance in many cases of from 20 to 80 rods), or should the city authorities maintain a street sewer, into which we can order these offensive sink drains to be emptied?'

"This description of the drainage conditions of one of the fairest (save this one unsavory fault) of our smaller Maine cities is not in the least complimentary, and we think that, in this connection, the citizens generally would not care to have the name of their town mentioned.

"As to the question in this particular Maine town, this condition is a nuisance detrimental to health, offensive to the eye and nostril, and serves to make the town repellent instead of attractive to the visitor. When its long-suffering citizens themselves are driven to complain, the local Board is constrained by considerations of equity. It would be manifestly a hardship to drive each citizen to abate the nuisance originating on his premises only when he can do so by building a drain 20 to 80 rods in length. Then why not apply that principle of co-operation which is the substratum of our civilized life, and each build a sewer the length of his lot and connect with it? Or, instead, and this would be far more equitable, it being a project for the public good, why does not the city put in a system of sewerage?"

MARYLAND.—*Baltimore*, 500,343: During the five weeks ending June 29th there were 874 deaths, of which 423 were under five years of age. Annual death-rate, 18.18 per 1000. There were 266 deaths from zymotic diseases, and 102 from consumption.

MASSACHUSETTS.—*Boston*, 415,000: There were 756 deaths during June, of which 250 were under five years of age. Annual death-rate, 21.86 per 1000. From zymotic diseases there were 155 deaths, and from consumption, 108.

MICHIGAN.—For the month of June, 1889, compared with the preceding month, the reports indicate that pneumonia, tonsillitis, and influenza decreased in prevalence.

Compared with the average for the month of June in the three years, 1886–88, inflammation of kidneys was more prevalent, and cholera-morbus, measles, and inflammation of bowels were less prevalent in June, 1889.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of June, 1889, at twenty-three places, scarlet-fever at thirty-seven places, typhoid-fever at sixteen places, and measles at nineteen places.

Reports from all sources show diphtheria to have been reported at one place more, scarlet-fever at eleven places less, typhoid-fever at six places more, and measles at four places less, than in the preceding month.

Detroit, 230,000 : Reports 210 deaths in June, of which 45 were under five years of age. Annual death-rate, 11.10 per 1000. From zymotic diseases, 36, and from consumption, 29.

MINNESOTA.—*St. Paul*, 180,000 : Reports for the month of June 164 deaths, of which number 102 were under five years of age. Annual death-rate per 1000, 10.90. From zymotic diseases there were 48 deaths, and from consumption, 6.

MISSOURI.—*St. Louis*, 440,000 : Reports for June 712 deaths, of which 316 were under five years of age. Annual death-rate, 19.18 per 1000. From zymotic diseases there were 173 deaths, and from consumption, 42.

NEW HAMPSHIRE.—The following contagious and infectious diseases were reported for the month of June :

Diphtheria : Nashua, 16 cases, making a total of 26 cases since May 1st. There has been considerable apprehension lest the disease assume an epidemic form in Rochester, Stratham, Claremont, Peterborough.

Scarlet fever : Bethlehem, Claremont, Nashua, and Manchester. The latter city reports 63 cases, making a total of 74 cases since May 18th. The clerk of the Board of Health makes the following report : " Up to June 22d, when I last examined the city clerk's record of deaths, there had been no fatal case of scarlet-fever, and I know of none since. The mildness of

the epidemic tends to make our people, and even many of our physicians, very careless."

Typhoid-fever: Laconia, Rochester, Freedom, Boscawen, Rye, and Manchester.

Whooping-cough: Henniker and New Boston.

Influenza and epidemic catarrh: Canaan, many cases.

German measles: Conway, many cases.

Measles: Manchester.

NEW JERSEY.—*Hudson County*, 282,254: Reports 601 deaths for June, of which 316 were under five years of age. Annual death-rate, 25.5 per 1000. From zymotic diseases there were 174 deaths, and from consumption, 52.

Paterson, 85,000: Reports 174 deaths during June, of which 106 were under five years of age. Annual death-rate, 24.8 per 1000. There were 61 deaths from zymotic diseases, and 17 from consumption.

NEW YORK.—The total reported mortality for June differs very little from that of May, and is almost the same as that of June, 1888. The infant mortality is, however, much increased. This is evidently due to the increase in the number of deaths from diarrhœal diseases, which is considerably greater than that of the corresponding month for the past five years, and is nearly ten times greater than that of May. Deaths reported as due to diseases of the digestive system are also increased in number. The deaths from all other causes, including those from zymotic diseases except diarrhœal, are less than in May; the mortality from scarlet-fever, which has prevailed in the Maritime and in part of the Southern Tier Districts since last year, being markedly diminished. No deaths from small-pox occurred, but a case of small-pox at Starkey, Yates County, originating in Geneva, and one in Binghamton taken from a train, having originated in Colorado, have been reported. In each 1000 deaths there were 109.80 from consumption; and 193.90 per 1000 above five years of age.

New York, 1,571,558: There were 3321 deaths, of which 1711 were under five years. Annual death-rate, 25.70 per 1000. From zymotic diseases there were 981 deaths, and from consumption, 376.

Dr. William A. Ewing has been appointed Sanitary Superintendent in place of Dr. Walter F. de Forrest Day resigned. Dr. Day had occupied the office for thirteen years, with apparent satisfaction to all concerned, although at the time of his appointment he was, like his successor, with little or no record as a practical sanitarian. His devotion to the duties of his office has been assiduous and forcible, but wholly devoid of ostentation ; and he leaves a record behind him well calculated to keep alive the pleasantest recollections of all who have had occasion to know him in his official relations.

The department is believed to be in admirable working order. It has a corps of accomplished officers and the confidence of the public. The new Superintendent has a charge worthy of the highest degree of skill and his best efforts for its attainment.

The report on the "Prevention of Consumption," published in preceding number, has been formulated by the Health Department, under date of July 9th, 1889, into the following :

Rules to be Observed for the Prevention of the Spread of Consumption.—Pulmonary tuberculosis (consumption) is directly communicated from one person to another. The germ of the disease exists in the expectoration of persons afflicted with it. The following extract from the report of the pathologists of the Health Department explains the means by which the disease may be transmitted :

Tuberculosis is commonly produced in the lungs (which are the organs most frequently affected) by breathing air in which living germs are suspended as dust. The material which is coughed up, sometimes in large quantities, by persons suffering from consumption, contains these germs often in enormous numbers. . . . This material when expectorated, frequently lodges in places where it dries, as on the street, floors, carpets, handkerchiefs, etc. After drying in one way or another, it is very apt to become pulverized and float in the air as dust.

By observing the following rules the danger of catching the disease will be reduced to a minimum :

1. Do not permit persons suspected to have consumption to

spit on the floor or on cloths unless the latter be immediately burned. The spittle of persons suspected to have consumption should be caught in earthen or glass dishes containing the following solution: Corrosive sublimate 1 part, water 1000 parts.

2. Do not sleep in a room occupied by a person suspected of having consumption. The living rooms of a consumptive patient should have as little furniture as practicable. Hangings should be especially avoided. The use of carpets, rugs, etc., ought always to be avoided.

3. Do not fail to wash thoroughly the eating utensils of a person suspected of having consumption as soon after eating as possible, using boiling water for the purpose.

4. Do not mingle the unwashed clothing of consumptive patients with similar clothing of other persons.

5. Do not fail to catch the bowel discharges of consumptive patients with diarrhœa in a vessel containing corrosive sublimate 1 part, water 1000 parts.

6. Do not fail to consult the family physician regarding the social relations of persons suffering from suspected consumption.

7. Do not permit mothers suspected of having consumption to nurse their offspring.

8. Household pets (animals or birds) are quite susceptible to tuberculosis; therefore do not expose them to persons afflicted with consumption; also do not keep, but destroy at once, all household pets suspected of having consumption, otherwise they may give it to human beings.

9. Do not fail to thoroughly cleanse the floors, walls, and ceilings of the living and sleeping-rooms of persons suffering from consumption at least once in two weeks.

By order of the Board.

EMMONS CLARK, *Secretary.*

Brooklyn, 821,525: Total deaths 1787--1045 under five years. Annual death-rate, 26.46. From zymotic causes, 537, consumption, 158.

Buffalo, 230,000: Total deaths (four weeks ending June 29th), 314, of which 106 were under five years. Annual death-rate, 14.20. From zymotic diseases, 31, consumption, 31.

Rochester, 110,000 : Total deaths, 128—40 under five years. Annual death-rate, 13.96. From zymotic diseases, 15, consumption, 17.

Albany, 103,000 : Total deaths, 156, of which 58 were under five years of age. Annual death-rate, 18.17. From zymotic diseases, 39, and from consumption, 17.

Syracuse, 80,000 : Total deaths, 92—20 under five years of age. Annual death-rate, 14.55. From zymotic diseases, 10, consumption, 18.

The five towns showing the highest rates of mortality were Newtown, 51.60 ; Portchester, 42.00 ; Gravesend, 40.00 ; Cobbleskill, 32.40 ; Middletown, 30.00.

The five lowest were Fort Edward, 2.45 ; Ellisburgh, 2.49 ; Brockport, 2.66 ; Clayton, 2.78 ; Salem, 3.31.

NORTH CAROLINA.—Aggregate population of the towns reporting for the month of June was 133,300, of which 59,515 were colored. Total deaths 202, of which 121 were colored. Deaths under five years 71, of which 48 were colored. Annual death-rate, 12.8 in the white population, 24.0 colored, and 16.8 in the total population per 1000. From zymotic diseases there were 81 deaths, and from consumption, 28.

Wilmington, 23,000 : Total deaths, 60. Annual death-rate per 1000, 31.2.

Charlotte, 11,000 : Total deaths, 26. Annual death-rate per 1000, 25.0.

Asheville, 10,000 : Total deaths, 15. Annual death-rate per 1000, 18.0.

OHIO.—The State Board of Health reports for the year ending October 31st, 1888, freedom from any widespread epidemics and an average condition of healthfulness during the year. There were three outbreaks of small-pox in restricted districts—quickly stamped out.

Much headway has been made in the process of organizing local boards of health throughout the State, and fuller and more explicit statistical returns brought about.

Special investigations have been made with reference to the conditions of typhoid-fever and diphtheria at Caldwell and Athens, respectively, and the water-supply of Salem, and a

special statistical report on typhoid-fever, diphtheria, and scarlet-fever, elicited by circular. There are also reports on cheese poisoning and trichinosis, and an abstract of the monthly reports summed up monthly in THE SANITARIAN. As recapitulated for the year, the population reported upon is estimated at 3,500,000; deaths, 30,818; death-rate, 8.8—"a remarkably low rate, surely," pretty clearly demonstrating defective statistics.

Deaths reported by cities and towns representing 1,021,400 population, 16,851; death-rate, 16.50. The highest death-rate was 19.26, in Cincinnati; the lowest was 7.07, in Mansfield.

Of the *causes*, a little more than 25 per cent were from zymotic diseases, of which 695 were by typhoid-fever; 881 by diphtheria, and 1329 by cholera infantum and diarrhœa. By consumption, 1907—11.3 per cent of the total number.

Forty-eight cities and towns, with an aggregate population of 1,153,500, reported to the State Board of Health for the month of June 1333 deaths, of which 550 were under five years of age. Annual death-rate, 11.55 per 1000. From zymotic diseases there were 352 deaths, and from consumption, 166.

Cincinnati, 320,000: Total deaths, 518; under five years, 239. Annual death-rate, 19.13. Zymotic, 145; consumption, 60.

Cleveland, 235,000: Total deaths, 341; under five years, 118. Annual death-rate, 17.41. Zymotic, 145; consumption, 39.

Columbus, 101,000: Total deaths, 88; under five years, 26. Annual death-rate, 10.46. Zymotic, 17; consumption, 9.

Toledo, 83,500: Total deaths, 81; under five years, 20. Annual death-rate, 11.64. Zymotic, 12; consumption, 6.

Dayton, 60,000: Total deaths, 72; under five years, 36. Annual death-rate, 13.40. Zymotic, 20; consumption, 9.

PENNSYLVANIA.—*Philadelphia*, 1,040,245: Reports for five weeks ending June 29th, 2067 deaths, of which 903 were under five years of age. Annual death-rate, 20.66 per 1000. From the principal zymotic diseases there were 356 deaths, and from consumption, 232.

"A little over" 100 cases of typhoid-fever weekly, with 11

deaths, the *Times and Register* of July 27th, thinks are no evidences that the drinking-water is at fault. It assumes that the germs of the disease in water which they befoul are regularly distributed throughout, insomuch that every person who partakes of it necessarily swallows some of them, and that, measuring the liability of Philadelphia's million of inhabitants with the population of Plymouth, "where every person who was susceptible to the disease" contracted it, the same ratio in Philadelphia would give 400,000 cases weekly instead of a little over a hundred, hence there are none at all!

Pittsburg, 230,000: Reports 423 deaths during the five weeks ending June 29th, of which number 263 were under five years of age. Annual death-rate, 18.68. From zymotic diseases (exclusive of diarrhœal), there were 51 deaths, and from consumption, 41.

The Bureau of Health has issued a pocket manual of the laws, ordinances, and instructions under its direction for the protection of the public health, gotten up in a style so attractive as to greatly promote public familiarity with them and add to the facility of their execution.

RHODE ISLAND.—*Providence*, 127,000: Reports for June 180 deaths, of which 58 were under five years of age. Annual death-rate, 17.01. From zymotic diseases there were 32 deaths, and from consumption, 26.

Newport, 22,000: Reports for June 24 deaths, of which two were under five years of age. Annual death-rate, 13.9 per 1000. No deaths were reported from zymotic diseases; consumption caused 3.

TENNESSEE.—The State Board *Bulletin* for July reports that the principal diseases, named in the order of their greater prevalence, in the State for June were—the different bowel affections, of which dysentery was the most prevalent type, then diarrhœa, cholera-morbus, cholera-infantum, malarial-fever, consumption, pneumonia, and tonsillitis.

Typhoid-fever is reported in the counties of Cannon, Davidson, Fayette, Franklin, Grundy, Hamilton, Houston, Knox, McMinn, Rhea, Sequatchie, Shelby, and Stewart. Mumps in Decatur, Dyer, Fayette, Henderson, Madison, Montgomery,

Wayne, and Williamson. Whooping-cough in Giles, Hamilton, Houston, Madison, Obion, and Stewart. Measles in Davidson, Montgomery, and Sumner. Scarlet-fever in Davidson, Grundy, and Shelby. Diphtheria in Decatur and Shelby. Erysipelas in Decatur and Washington. Roseola in Stewart. Meningitis in Obion. German measles in Sumner. Varioloid in Hawkins.

In the chief cities the respective annual death-rates for the month per 1000 of population are reported as follows :

Chattanooga,	white,	9.33;	colored,	29.53 :	15.65
Clarksville,	"	4.80 ;	"	28.00 :	13.50
Columbia,	"	8.00 ;	"	18.00 :	12.00
Knoxville,	"	11.41 ;	"	30.07 :	15.23
Memphis,	"	14.68 ;	"	22.79 :	18.38
Nashville,	"	16.05 ;	"	23.14 :	18.60

WISCONSIN.—The State Board of Health reports for the year 1888, the people gradually becoming better informed concerning the principles and limitations of preventive medicine.

The Secretary and Executive Officer, J. T. Reeve, M.D., expresses gratification at the general good health throughout the State during the year, and the promptitude of local boards of health in dealing with outbreaks of infectious diseases. Typhoid-fever and diphtheria are more particularly dwelt upon as the most persistent and widespread infectious diseases in the State, and the most needful of attention. Besides the Secretary's report, there are special reports : Upon the Preventable Causes of Typhoid-fever, by Professor R. Bartholow ; Leprosy, by K. Hoey, M.D. ; Rum Remedies, by Dr. J. L. Kaine ; The Charlatan and his Methods, by Professor T. W. Chittenden ; The Higher Sphere of Sanitary Science, by Rev. D. L. Holbrook ; A Word About School Sanitation, by Professor I. N. Stewart, and the Sanitary Examination of Water, by Professor W. W. Daniels.

Recent laws requiring the organization of local boards of health and the registration of vital statistics are added ; but they seem to have not been sufficiently long in force to afford any stated results. The number of cases of infectious diseases reported are summed up, together with the deaths therefrom,

as follows: Diphtheria, 2314, deaths, 458—19.79 per cent; scarlet-fever, 2142, deaths, 193—9.01 per cent; typhoid-fever, 1288, deaths, 132—10.25 per cent; measles, 9479, deaths, 113—1.02 per cent; whooping-cough, 4736, deaths, 59—1.32 per cent; diarrhœal diseases, 3448. "Nothing definite can be said concerning the death-rate of diarrhœal diseases, for the reason that few of the reports contained figures from which conclusions of any value could be drawn."

Milwaukee, 210,000: Reports for the month of June 210 deaths, of which 44 were under five years of age. Annual death-rate per 1000, 11.6. From zymotic diseases there were 26 deaths, and from consumption, 28.

ENGLAND.—*The Small-pox Epidemic of Sheffield.* DR. BARRY'S Report on the Epidemic of Small-pox at Sheffield, during 1887–88, with an Introduction by DR. BUCHANAN, the Medical Officer of the Local Government Board, 1889, is one of the most complete studies of small-pox and vaccination hitherto published. It is a folio document of 326 pages, many diagrams and charts, and numerous tables, showing all the conditions, circumstances, and statistics of the population and the epidemic.

It comprises a house-to-house visitation of 59,807 houses, with a vaccination census of 275,878 persons out of a population estimated at 316,288, and takes account of 6088 small-pox cases, with 590 deaths.

With regard to vaccination, the census of school children in 1888, found less than one per cent unvaccinated. But among the people of all ages there was enough omission for the enumerators to have reckoned, all told, two per cent of unvaccinated persons. This two per cent of the population, Dr. Buchanan remarks, claims to be regarded as so many seventeenth or eighteenth-century people scattered about Sheffield, for the very purpose of having themselves compared, under nineteenth-century conditions of life, with the law-abiding people of the present period.

All the circumstances influencing the spread of small-pox are considered in detail. The influence of vaccination, stated as concisely as possible, shows that, of

Children under ten years of age, the small-pox attack rate per 1000 of the vaccinated was 5; of the unvaccinated 101.

The death-rate of the vaccinated was 0.09; of the unvaccinated 44.

Per 1000 of the number of persons over ten years of age, the attack-rate in those who had been twice vaccinated was 3; in those once vaccinated, 19; in those who had not been vaccinated, 94.

The death-rate among those who had been twice vaccinated was 0.08; among those who had been once vaccinated 1; among those who had not been vaccinated, 51.

Per 1000 of persons of all ages, in the vaccinated, the attack-rate was 15.5; in the unvaccinated, 97. The death-rates were, respectively, 0.7 and 48.

The report furnishes a mass of facts on the benefits of vaccination and the penalties for its neglect, of great importance to all communities, and worthy of the widest possible dissemination.

THE PARKES TRIENNIAL PRIZE of £100 and a gold medal for the best essay on the Etiology and Prevention of Yellow-fever has been awarded to Surgeon Firth of the Army Medical Staff. The subject for the next prize is "The Influence of Soil as a Factor in the Production of Disease, especially in Hot Climates." The competition is open to all medical officers of the army, navy, and Indian services of executive rank on full pay.

INFECTIOUS DISEASES ABROAD DURING THE SECOND QUARTER YEAR, 1889.

BY returns at hand from abroad, the number of deaths reported from infectious diseases during the *three months* ending June 30th, 1889, was from:

Small-pox in Manchester, 1; Bristol, 1; Amsterdam, 2; Paris, 37; Lyons, 22; Marseilles, 36; Nantes, 1; St. Etienne, 19; Havre, 24; Rheims, 1; Nancy, 8; Amiens, 24; Limoges, 1; Munich, 1; Vienna, 3; Prague, 92; Trieste, 1; St. Petersburg, 13; Warsaw, 44; Odessa, 8; Genoa, 5; Venice, 41; Bucharest, 12; Brussels, 1; Ostend, 97.

Measles in London, 667; Liverpool, 87; Glasgow, 251; Manchester, 256; Leeds, 142; Hull, 142; Amsterdam, 89;

Rotterdam, 124; Paris, 329; Marseilles, 160; Berlin, 38; Munich, 73; Cologne, 95; Frankfort, 84; Vienna, 125; St. Petersburg, 46; Genoa, 55; Brussels, 2.

Scarlet-fever in London, 149; Liverpool, 61; Glasgow, 34; Manchester, 22; Sheffield, 71; Paris, 54; Berlin, 27; Munich, 36; Magdeburg, 21; Stuttgart, 28; Vienna, 36; St. Petersburg, 130.

Fevers—Typhus and Typhoid in London, 102; Liverpool, 54; Glasgow, 19; Birmingham, 9; Manchester, 13; Dublin, 45; Belfast, 29; Paris, 144; Marseilles, 57; Havre, 26; Berlin, 65; Vienna, 27; St. Petersburg, 251; Brussels, 7.

Diphtheria and croup in London, 401; Glasgow, 76; Paris, 460; Lyons, 69; Marseilles, 84; Bordeaux, 36; Berlin, 218; Munich, 97; Dresden, 40; Leipzig, 55; Frankfort, 65; Vienna, 117; Budapest, 106; Prague, 81; St. Petersburg, 93.

Whooping-cough in London, 541; Liverpool, 113; Glasgow, 360; Birmingham, 81; Paris, 131; Copenhagen, 4; St. Petersburg, 71; Brussels, 7.

During the first quarter, ending March 31st, the number of deaths reported from *small-pox* was, in Lisle, 9; Amiens, 78; Lemberg, 23; Rome, 43; Genoa, 18; Bologne, 24; Madrid, 29; Lisbon, 38; Buenos Ayres, 22.

Populations and death-rates *in foreign cities* during the second quarter, 1889, as follows: London, 4,351,738, 15.9; Liverpool, 606,562, 19.2; Glasgow, 528,144, 26.0; Birmingham, 454,835, 17.5; Manchester, 378,800, 28.0; Leeds, 357,449, 22.3; Dublin, 353,082, 23.6; Sheffield, 327,227, 19.2; Edinburgh, 266,900, 16.5; Bradford, 235,056, 18.0; Belfast, 229,622, 24.3; Bristol, 229,361, 16.1; Hull, 208,017, 20.3; Newcastle, 160,983, 23.7; Brussels, 182,836, 20.3; Amsterdam, 399,015, 23.9; Rotterdam, 197,723, 24.9; The Hague, 153,440, 18.9; Paris, 2,260,945, 22.1; Lyons, 401,930, 20.2; Marseilles, 376,143, 27.5; Bordeaux, 240,582, 19.7; Nantes, 127,482, 19.7; St. Etienne, 117,875, 24.9; Havre, 112,074, 26.3; Rheims, 97,903, 24.8; Nancy, 83,500, 23.0; Amiens, 80,288, 22.2; Nice, 78,482, 27.0; Berlin, 1,453,571, 27.7; Hamburg, 563,263, 23.9; Breslau, 313,451, 34.0; Munich, 284,886, 32.4; Dresden, 264,196, 22.8; Leipzig, 213,240, 22.1; Cologne, 273,500, 24.6; Magdeburg, 175,563, 33.6; Frankfort, 167,194, 23.4; Königsberg, 158,489, 33.3; Han-

over, 151,836, 19.6; Düsseldorf, 129,330, 21.9; Nuremberg, 125,906, 28.8; Bremen, 122,652, 19.7; Chemnitz, 122,065, 36.0; Stuttgart, 119,367, 22.9; Dantzig, 119,288, 28.1; Strassburg, 117,873, 25.1; Altoona, 114,514, 22.7; Barmen, 108,174, 22.3; Aix-la-Chapelle, 103,017, 21.2; Vienna, 811,-434, 26.6; Budapest, 452,907, 31.6; Prague, 304,356, 27.0; Trieste, 158,084, 22.3; Copenhagen, 307,000, 22.9; Stockholm, 221,549, 19.8; Gottenberg, 99,000, 17.7; Christiana, 138,300, 20.6; St. Petersburg, 988,016, 30.1; Warsaw, 444,-814, 26.4; Odessa, 272,000, 24.6; Geneva, 186,858, 24.5; Venice, 153,375, 27.7; Bucharest, 206,000, 27.8.

Populations and death-rates during the first quarter, 1889: Utrecht, 81,308, 24.1; Lisle, 188,272, 27.9; Roubaix, 100,-456, 25.2; Amiens, 80,288, 25.3; Geneva, 52,043, 19.8; Lemberg, 121,610, 28.9; Gratz, 106,343, 30.3; Moscow, 753,-469, 38.1; Rome, 401,044, 30.4; Turin, 306,398, 22.0; Genoa, 186,858, 28.8; Bologne, 136, 608, 29.8; Livourne, 102,893, 26.0; Madrid, 480,000, 39.5; Valence, 143,239, 37.0; Lisbon, 242,297, 35.6; Buenos Ayres, 482,254, 28.1; Madras, 398,777, 47.8.

A REMARKABLE EPIDEMIC OF PNEUMONIA.—In the *Maritime Medical News* for May there is an account of an epidemic of pneumonia in Prince Edward Island. During the months of February and March no less than 546 cases occurred in the practice of twenty-six practitioners, and at the date of the report the disease was still very prevalent. As there are over fifty practitioners in the island, it is computed that the total number of cases is fully upward of one thousand. As the population of the island does not exceed 150,000, the number attacked is very great. It appears that in the majority of cases the pneumonia was attended by acute bronchial catarrh. The catarrhal complications, which in some cases also involved the larynx and middle ear, were more frequent in children and the aged. In the 546 cases reported there were only forty deaths, a decidedly low mortality. It is interesting to note, in connection with the cause of this epidemic, that the past winter was characterized by an abnormally high temperature throughout, together with much rain.

MEDICAL EXCERPT.

FROM THE PROCEEDINGS OF THE FORTIETH ANNUAL MEETING OF THE AMERICAN MEDICAL ASSOCIATION, NEWPORT, R. I., JUNE 25TH–28TH, 1889.

W. W. DAWSON, M.D., of Cincinnati, O., President, in the chair.

DOCTORS' VISITS AND RHODE ISLAND HOSPITALITY.

The proceedings opened with an address of welcome by the Hon. HERBERT W. LADD, Governor of Rhode Island, who said: "Doctors' visits were not often greeted with a smile, but the present occasion was a pleasant exception. That why Rhode Island is proverbial for hospitality, the members of the American Medical Association would shortly experience, and he hoped that all would carry away with them pleasant memories of Newport."

Hon. JAMES H. ELDREDGE, M.D., of East Greenwich, ex-President of the Rhode Island Medical Society, and one of the oldest members of the American Medical Association in the State, gave a cordial welcome from the profession of Rhode Island.

MEDICAL SCIENCE AND MEDICAL MEN IN AMERICA

was the subject of the President's opening address. He said:

"Since medical science and medical men are prominent factors in society, among every people, we may well ask, what they have accomplished, what part they have here taken in the solution of the vital problem? In the 'Century of Medicine,' Professor E. W. Clark in his classical address says:

"'It is not an extravagant assertion to say, that in all this turmoil, change, and progress (referring to the revolutions and changes in society, religion, and governments for the past century), medicine has kept abreast of the other natural sciences,

of politics, and of theology, and has made equal conquest over authority, error, and tradition,' and, it may be added, has contributed largely to man's comfort, happiness, and advancement. To intensify this, reference need only be made to some of our triumphs, to vaccination, to anæsthesia, to sanitation, the prevention of pestilence, the lengthening of human life. . . .

"In making a retrospect of our profession it may be well to look for a moment at medical teaching in this country.

"The way is long between Aristotle and Bichat, and Buckle says that he found no middle-man in this long period; it is darker than it is long. During all this time medicine was not taught legitimately. The renaissance, if it may be so called, began with Hunter and Bichat. No real progress, however, could be made while oxygen remained locked in the silent embrace of all organic and inorganic nature. Priestly, escaping from the religious and political contests, and it may be persecutions, of the old world, came to this country to demonstrate his great phlogiston—Oxygen.

"Bichat and Hunter restored the proper study of medicine. They represent the turning-point from idealism, speculation, and theory to accurate and close observation. The latter, John Hunter, in 1767, was lecturing and taking students into his own house, and it is curious to know that here, in far-off America, Shippen and his contemporaries in Philadelphia and New York, about the same time, or very soon after, began teaching medicine and surgery upon essentially the same plan. Of these men, one who so recently passed away that you can almost hear the sound of his voice and feel his magnetic presence, when speaking of the men who lived at the close of the last, and during the early part of this century, said, and justly said, 'Not a few of them were the worthy peers of Roux, Abernethy, Crampton, Bell, Graefe, and Scarpa.' . . .

"Every one travelling through the States—especially of the West and South, and those situated in the far-away mountains and on the Pacific—must be impressed with the onward march of public instruction, the gradually increasing general intelligence, and the vast sums that are annually expended for the education of the people. Public school buildings, by their size, adaptation, and attractive surroundings, give an impression which the most sceptical must feel, a promise of the

future which cannot be misread. From such as these, scientific medicine must reap a share. Every teacher, everyone connected with the examination of candidates for the medical degree, knows—and the knowledge is reassuring—that year after year the grade of the medical student is advancing, that the material out of which the practitioner is made is constantly growing better, becoming stronger—in other words, that the preliminary education of our students is steadily becoming more broad and comprehensive. I gave utterance to this view a few years ago, in an address which I had the honor of delivering to the State Medical Society of Ohio. Time, I believe, has confirmed what I then said. This confirmation is seen in our graduates as they go forth to take up the line and battle of life. Are they not the equals of the graduates in other professions, in law and theology? As life advances, are they not the peers of any in all the useful elements of true manhood? Are they not the citizens of best rounded characters, citizens most relied upon by their neighbors in foul as well as fair weather?

"Again, in addition to facilities already referred to, the most generous provisions are being made, all over our land, for institutions which will be worthy to be called universities. From these, graduates will emerge worthy to rank by the side of those bearing the prized degrees from Oxford, Cambridge, Paris, Heidelberg, or Leipzig. . . .

"Let us not, gentlemen, be impatient; the influences are already projected that will give us students equal to, up to, the highest standard of preliminary preparation. If we have accomplished so much in our primitive stage, what may we not expect when all our great preparatory works come fully into action?

"From this view of the resources from which medical students are to be drawn, and of the liberal preparations and facilities for their culture, we may well ask, what is the profession doing to profit from such advantages?

"Some of the classical schools at Oxford and Cambridge were organized as early as the thirteenth century, but the systematic, scientific study of medicine and surgery came long subsequently—not four hundred years later—about the middle of the eighteenth century. It was first projected in Great

Britain, and soon after in our Atlantic cities. Unlike the Old World, our fathers had a wilderness to conquer before progress could be made. When the Pilgrim Fathers left England, reading and writing were rare accomplishments ; chimneys in that country had just been invented, and flock beds were luxuries. The adventurers—the emigrants to these shores from that ancient and imperfect civilization—had much to learn, but in the midst of their pitiable ignorance, facing great hardships and pressing wants, they were quick to provide educational opportunities for all. The result of their efforts are apparent—they are before us. Could more have been accomplished in one century? . . .

"For the introduction of young gentlemen into the profession there is a mutual responsibility between teachers and preceptors. In very truth it may be said that colleges do their duty, their very best, with the students furnished by the preceptors. Give us liberally-educated young gentlemen and we will furnish graduates worthy of the degree. Medical colleges, however, do not make the physician. They merely furnish the foundation work ; the individual must do the balance. In no place is evolution so marked—the fittest will and should survive."

The Address in Medicine, by WILLIAM PEPPER, M.D., of Philadelphia, was

A STUDY OF BENJAMIN RUSH AS PHYSICIAN, PHILANTHROPIST, AND PATRIOT.

"His political services, although great, were less important than those he rendered to science. The political appointments of Rush were laborious and unprofitable, as he refused pay for public services. In 1785 he started the Philadelphia Dispensary, and this example was followed by many others. He was profoundly interested in moral philosophy, and attracted general attention by his writings in this department. Among the first to indict capital punishment, he started a powerful plea for reforming the penal code. In range of subjects and grasp of them, it is hard to equal him. . . .

"In the vital matter of education Rush was active and progressive, and much ahead of his time. He labored to establish our public school system, and defended the Bible as a school-

book. Universal education is the only safety of the republic. The evidences of genuine and unaffected piety show in his writings and career. The subject of religion was constantly touched upon with sincerity and an absence of sectarianism. He was active in philanthropy, education, and religion to the end of his life, but Rush was before all else a physician. The study of medicine was followed with a passionate intensity. From 1789 to 1813 Rush's history is largely the history of American medicine. He was influenced by the genius of Sydenham in medicine, and of Franklin in philanthropy. Sydenham was a true Baconian in his close observation of facts. Posterity judges the pupil to be worthy of the master. The excellence of the teacher was shown by the testimony of his pupils. Students went to Philadelphia from all parts of the country to profit by his teachings. Rush was the earliest advocate of advanced medical education."

Dr. A. L. GIHON, United States Navy, Chairman of the RUSH MONUMENT COMMITTEE, reported the regrets of the Committee at not being able to report progress. Indeed, the Committee doubted if the project would be completed within their expectancy of human life. Attention was invited to the fact that the founders and leaders of every other profession and calling have been honored by fitting monuments and tributes. That while we join in hurrahing for the names of generals, politicians, and others, we forget the illustrious members of our own profession. It was believed a few years ago that the bare mention of the project would call forth spontaneous contributions of not less than one dollar from each of the forty thousand members of our profession. But the treasurer of the Committee now reports the receipt in five years of only the first thousand. It is true that other great monuments have met with slow contributions. But of late there have been notable exceptions. In conclusion, the committee begged to resign to the Association their appointment, in the hope that some other members may be found who shall discover some shorter way of securing the funds. They entreated the Association, however, never to abandon the project.

Dr. HERRON moved that one member from each county society be appointed for the purpose of personally soliciting contributions to the Rush Monument fund. The motion was

carried, as was also a motion that subscriptions be received immediately.

THE SECTIONS, severally, met in the places assigned them in the Casino.

SECTION OF THE PRACTICE OF MEDICINE, MATERIA MEDICA, AND PHYSIOLOGY, opened with the address of the Chairman, F. C. SHATTUCK, M.D., of Boston, comprising a concise REVIEW OF MEDICAL PROGRESS, in substance as follows:

"In the treatment of pulmonary phthisis the inhalation of hot air has been tested and its intrapulmonary germicidal action is still unsolved. In the pathology of pancreatic disease Senn and Fitz rendered important service, and the latter has shown in his recent work that acute pancreatitis seems to be due to the extension of acute inflammation from neighboring organs. The diagnosis of pancreatic affections is thus shown to be not so difficult as was once supposed. Frerichs long ago, and Lancereaux more recently, have both called attention to the relation between atrophy of the pancreas and diabetes mellitus. In certain cases of diabetes the organism has lost its power of bringing the fatty acids to their normal end products, and in these cases diabetic coma is liable to occur. Graeber distinguishes the anæmia by a count of the red corpuscles and a hæmoglobin estimation. Hunter thinks that anæmia is an entity and probably depends on increased blood destruction in the liver. The chemical study of stomach disease has not given all that was hoped for it. The use of cold baths in typhoid-fever still seems to be justified by favorable results. Sulphonal and amylene hydrate have proven themselves to be valuable additions to our list of remedies of this class. In the use of suspension in the treatment of locomotor ataxia, deductions cannot yet be drawn with certainty. On the whole, the progress of medicine for the past year has been gradual but noticeable."

Dr. CHARLES G. STOCKTON, of Buffalo, N. Y., read a paper on the

PASSAGE OF PORTAL BLOOD INTO THE GENERAL CIRCULATION, AND ITS PROBABLE RELATIONS TO TOXÆMIA.

After speaking of the difficulty of explaining the coma accompanying some diseases and their relation to the hepatic

circulation and the inosculations and anastomoses in certain regions, he said that the portal blood underwent changes more or less before passing through the liver, and the blood of the portal vein was toxic. Nature probably tries to prevent the toxæmia which is inevitable in so many cases by returning the blood through the other anastomoses than through the liver.

Dr. WILLIAM OSLER, of Baltimore, said the facts stated in the paper were only partly true, inasmuch as the anatomical facts could not always explain the conditions. Much depended upon how the collateral compensatory circulation was established. Post-mortem examinations often show cirrhosis with no previous symptoms. The portal vein may be obliterated by fibroid condition, and yet no toxæmic effects may be shown.

Dr. W. S. TREMAINE, United States Army, said the portal circulation is a part of the venous circulation. We too often speak of them as different. The action of the liver is similar to that of a filter. We do not understand altogether the action of the liver. These toxic symptoms are due to defective action on the part of the liver, whatever this action may be. The blood is an organ, not a fluid. The action of digestion is carried on in the blood. Physiologists and pathologists know very little about clinical facts, and we should not draw wrong deductions. Some of these so-called facts are only theories. We should combine the two, and not take the theorist's opinion when he was not versed in clinical facts.

Dr. JOHN H. MUSSER, of Philadelphia, read a paper on

SOME CLINICAL ASPECTS OF VOMITING.

After reviewing the act of vomiting, he divided the acts into direct and reflex. Changes in the organs of sense, etc., will also cause vomiting. The duration, time of day, character of vomitus should all be considered in looking for the cause. In naso-pharyngeal catarrh morning vomiting is not infrequent; in chronic uterine disease also. Sudden and painless vomiting in the aged is often one of the first symptoms of cerebral hemorrhage. There is no exhaustion in this kind. If collapse occur it may be uræmic vomiting. Prognosis is always grave in these conditions. In all conditions of vomiting the causes should be looked for in every one.

Dr. STOCKTON thought it was difficult to go over all the causes which might cause vomiting. Chronic gastritis often occurs with naso-pharyngeal catarrh, which would explain the statement just made.

Dr. W. J. SCOTT, of Cleveland, said in naso-pharyngeal catarrh there was also chronic dilatation of the stomach with catarrhal conditions which would explain the facts stated by the reader.

Dr. I. E. ATKINSON, of Baltimore, read a paper on

SOME OF THE RARER AND GRAVER FORMS OF CINCHONISM.

Cinchona and its allies are generally given without regard to idiosyncrasies. Intoxication, etc., which may occur as the result of cinchonism, may be very grave. The absolute frequency of cinchonism is not great, but worthy of notice. He had collected over fifty cases of quinine amaurosis, in which the blindness was present in nearly all. The vision is often affected without suspicion of the drug. In most cases the blindness occurs suddenly, but in many cases it may be gradual. It may occur within twenty-four hours. In all, or nearly all cases, the sight returns, but the eyes are often affected for a longer time, even after two years, and color-blindness often permanently results. The blindness is almost complete, the color-blindness is marked for a long time ; the pupils are much dilated, the disks are white and pallid ; there is contraction of the visual field ; impairment of hearing is often noticed ; some patients have anæsthesia of the cornea, strabismus, etc. Knapp showed that relapses may occur with very small doses. The pathogenesis of quinine amaurosis is not at all understood, although many explanations have been offered. The dose of quinine sufficient to produce blindness is very variable. H. C. Wood had seen it after doses of twelve grains. Blindness always results when the causes are lethal. Immense doses are taken without causing blindness, so that it undoubtedly occurs as an idiosyncrasy. Tinnitus aurium is common, but permanent deafness has never been recorded, even complete temporary deafness has probably never been observed. In those already deaf this deafness may be increased. In the ear there is much anæmia. Enormous doses of quinine are necessary to produce death, and fatal

cases of cinchonism have rarely been recorded. The cardiac conditions described in the autopsies of the various fatal cases are very dissimilar. Sufficient attention has not been given to the dangerous and toxic effects of quinine in large doses.

Dr. TREMAINE gave his experience, in which he said that in malarious districts large doses were necessary, and in non-malarious districts large doses did harm.

Dr. CRONYN spoke of Bence Jones's theory in regard to the effect of large doses of quinine on the appearance of the blood. He thought if too much of a drug were given the excess was passed off by the bowels.

Dr. H. A. HARE said that other substances showed this condition of the blood besides quinine, and this theory of Bence Jones did not hold good to-day.

Dr. LISTER agreed with Dr. Cronyn, but thought that the combination of several drugs might be more effective.

Dr. I. E. ATKINSON, in conclusion, said he only wished to bring forward the one fact that excessive doses of quinine had been fatal. In reply to Dr. Hare he would refer to the habit of giving calomel before quinine, which increased the acidity of the gastric secretions. Hypodermic injections would obviate this. One case in a lifetime should prevent us from giving it too lavishly, and compel us to give it under the skin. He had collected fifty known cases, and probably there were many unrecorded cases.

Dr. ROBERT T. EDES, of Washington, read a paper on

HYDRONEPHROSIS AND RENAL ATROPHY; ESPECIALLY AS RESULTING FROM FUNCTIONAL DISTURBANCES OF MICTURITION.

The ordinarily recognized mechanical causes of hydronephrosis were stated. Systematic authors admit that there are cases not explicable by any of these causes. Two cases were reported: 1. A boy with frequent micturition but probable retention of urine, who presented symptoms of interstitial nephritis, and was found, after death, to have a large bladder, dilated ureters, atrophied kidneys, and hypertrophied heart; no mechanical obstacle being present. 2. A little girl with albumen, casts, and pus in the copious, light urine, was noticed to have some difficulty in micturition. After dilatation of the

urethra, the casts soon disappeared and later the albumen. The back pressure of urine necessary to produce moderate hydronephrosis with renal atrophy is not great. The bladder is a portion of the apparatus necessary for the discharge of the urine, and is not to be regarded simply as a passive reservoir. In order that it may perform its function properly a certain balance between the nervo-muscular apparatus promoting the discharges (detrusor urinæ) and that restraining it (sphincter vesicæ) is necessary. If this balance is disturbed either by paralysis of the detrusor or by spasm of the sphincter, pressure is thrown back toward the kidneys and dilatation of the passages takes place, followed by renal irritation and destruction of the parenchyma. In the constantly recurring spasmodic action of the bladder in cystitis, with the consequent exaggeration of the intravesical pressure, the same thing may occur, with this modification, that the urine which is backed up, being mingled with inflammatory products, the result is a pyonephrosis, rather than a hydronephrosis.

It is suggested that some cases of interstitial nephritis in the young, even when accompanied by hypertrophy of the heart, and not differing greatly in symptoms from the disease which is more familiar in persons in middle life, may have a local origin in unrecognized cases of this kind rather than the constitutional changes so prominent in the etiology of the Bright's disease of later years. A few cases are to be found in medical literature bearing on the subject of the paper.

Dr. FRANCIS DELAFIELD, of New York, read a paper on

CHRONIC ENDOCARDITIS.

Few cases are more common than this disease, and it may be present within great variations, from a mere inconvenience to great distress on the part of the patient. Nearly all the most important symptoms of chronic endocarditis are due to the disturbances produced in the distribution of the blood throughout the body. It is not easy to say why, in some cases of chronic endocarditis, there are disturbances of the circulation, and why in other cases there are not. The disturbances of the circulation are due to the endocarditis, dilatation, and hypertrophy of the ventricles, inflammation or degeneration of the wall of the heart, inflammation of the

coronary arteries, abnormal heart-action, and the associated pulmonary emphysema, chronic endarteritis, and chronic Bright's disease. These conditions, all of them, must be considered in connection with chronic endocarditis. In regard to the last condition mentioned—namely, chronic endarteritis and chronic Bright's disease, he found that albumen was present, casts less constant. Anæmia and dropsy are present, and the patient gets worse. Changes in structure much the same, however the symptoms may be. Arterial walls thickened. There are three forms of chronic nephritis: 1. Chronic nephritis with much exudation; serum exudes from blood-vessels to the urine; amount of urine varies; specific gravity is lower; albumen and casts are constant; patients do badly. 2. Nephritis with moderate exudation; urine diminished; specific gravity lower; no albumen or casts present unless patient does badly; liable to dyspnœa, headache. 3. Chronic nephritis with little or no disturbances; urine shows no change; they gradually grow worse and die.

Dr. WILLIAM PEPPER, of Philadelphia, said he was glad to hear the author of the paper dwell on the changes in the arteries. Our knowledge of the nerve-ganglia about the heart is very defective. Rest in bed is important in the prevention of extension of the disease. In the cases where there is no sign of progressive lesions we should still be on our guard. In some cases bleeding does a great deal of good, even when the cases seem to be anæmic.

Dr. WILLIAM OSLER, of Baltimore, thought chronic endocarditis produced in itself no symptoms. So long as compensation is perfect the patient needs no help.

Dr. JAMES TYSON, of Philadelphia, read a paper on

THE INDUCTION OF PREMATURE LABOR IN BRIGHT'S DISEASE.

We should bring on premature labor: 1. In cases of Bright's disease where in previous pregnancies the symptoms had been extremely severe and dangerous. 2. In all primiparæ in whom there is Bright's disease previous to pregnancy. 3. Those in which we have not the knowledge acquired in the previous cases. A large number of such cases terminate by

miscarriage, and terminate well for the mother. It might not be a bad idea to examine the urine of every woman before marriage. A few cases may progress to full term without fatal issue, but these are exceptional cases. Each case must be decided on its own merits.

Dr. V. C. VAUGHAN, of Ann Arbor, Mich., thought the points raised by the speaker were very important, and his experience taught him to do the same, except in the case of primiparæ, where diet can do much by limiting the amount of proteid food.

Dr. J. C. WILSON, of Philadelphia, thought the early recognition of the renal trouble was important, and that therefore the earliest possible examination of the urine should be made.

Dr. TYSON did not mean to say that premature labor should be induced in every primipara, but that in primiparæ it was very dangerous.

Dr. GEORGE M. GARLAND, of Boston, read a paper on

RAYNAUD'S DISEASE.

Gangrene in this form was not understood until some investigators, such as Virchow and others, gave as their theory that this symmetrical gangrene, or, as it was later called, Raynaud's disease, was due to certain disturbances of the trophic nerves. The patient has a numb or dead feeling in the part affected, and the temperature is reduced. Then there may come symmetric asphyxia, in which there is pain and blue color of the parts on both sides. In the third stage dry, mummified, or moist gangrene sets in, with great pain. Fatal cases occur. The theory is that it is a tropho-neurosis, but the theories vary widely. It is evident that similar conditions are produced by different causes. Erytho-melalgia may be considered in this connection, it occurring symmetrically. The treatment is not satisfactory.

(*To be continued.*)

LITERARY NOTICES.

Wood's Medical and Surgical Monographs continue to maintain their excellence. The subjects on which they treat are skilfully chosen, with evident reference to the most important needs of medical practitioners.

The number for June treats of *General Orthopedics, including Orthopedic Surgery*, by Dr. August Schreiber, Surgeon-in-Chief to the Surgical Division of the Augsburg Hospital. The recent advances in this department of surgery are remarkably well summed up in a volume of three hundred and fifty-six pages, elaborately illustrated. Plain methods for early diagnosis and clear suggestions regarding treatment, in conjunction with a lucid study of the etiology and pathology of deformities, are the most prominent features of the work. It includes the Index of Vol. II. of the Monographs which this volume completes.

The volume for July comprises five essays: *Cancer and Cancerous Disease*, by Sir Spencer Wells, Bart., F.R.C.S.; *Cardiac Dyspnœa and Cardiac Asthma*, by Professor S. von Basch; the *Influence of Menstruation, and of the Pathological Conditions of the Uterus in Cutaneous Diseases*, by Dr. L. Grellety, Consulting Physician at Vichy, Silver Medallist of the Academy, Secretary of the Therapeutical Society, etc.; *Tension as Met with in Surgical Practice, Inflammation of Bone, Cranial and Intracranial Injuries*, by T. Bryant, F.R.C.S.; and *Antisepsis and its Relation to Bacteriology*, by Dr. J. Neudorfer, Royal Staff-Physician and Director of the General Poliklinic, Vienna. These essays are all remarkable for their comprehensive terseness, comprehending just enough of the history of the subjects of which they treat to admit of a concise application of the best practice deducible from recent advances in the study of their respective subjects. Price, $10 a year; $1 a number. New York: William Wood & Co.

The Physician Himself and Things that Concern his Reputation and Success. By D. W. Cathell, M.D., Balti-

more, Md. Ninth edition, revised and enlarged. 8vo, pp. 3c0. Price, $2. Philadelphia and London : F. A. Davis, Publisher.

Twice before THE SANITARIAN has had occasion to express its good opinion of this book ; now "the ninth edition, carefully revised, . . . and a great deal of new material added," all of which is not improvement. Too much space is devoted to Hahnemannism—"the ridiculous delusion . . . of infinitesimal doses of oyster-shell, teaspoonful doses of *aqua pura*, one drop of aqua cinnamomi, or an unmedicated globule of saccharum every Friday night—changing with every decade, until now it scarcely exists at all except in name." Yet, the author adds, "When you have a Lah-de-Dah patient who needs only a few drops of mint-water or a bread pill, for mercy's sake don't, don't violate common sense and force upon him some horrible mixture," etc., but "give him nothing stronger or coarser than he needs, and leave the rest to nature."

Nature never indicates the use of a bread pill or any other lying practice to aid her resources. And the physician who practises such arts is a no less contemptible impostor than he who prescribes an unmedicated globule of saccharum every Friday.

"Those things that are or have been justly determined ought not to be moved or altered, either by purging or other irritating medicines, *but should be left alone*," said the father of medicine more than two thousand years ago—an observation which has not been improved upon since ; and the physician who adulterates it by the use of bread pills or any other deception is a disgrace to the profession.

It is to be regretted, certainly, that a work such as this is intended to be—a guide-book, and, for the most part, excellent in other respects—should be marred by the forgetfulness of the author to continuously keep in the foreground the cardinal tenets of the subject at issue.

MODERN CEMETERIES, an essay upon their improvement and proper management, by J. WEIDMANN, Landscape Architect, etc., published by the *Monumental News*, Chicago, is a pamphlet of one hundred and fifteen pages, describing modern cemeteries, with numerous illustrations as they should be, in

contrast with palpable defects as they too commonly are. Considerable is said about the importance of distance, the nature of the soil, drainage, and the relation of cemeteries to *existing* populations, but, as a matter of course, wholly inapplicable to the common expansion of American cities and the ultimate incorporation of cemeteries into building sites.

Cremation is referred to as a barbarous system, revolting to the sensibilities, while the far more revolting process of putrefaction and loathsome seepage of dead bodies into the watercourses to poison the living is ignored !

Scarcely less surprising is the omission of any notice of the "New Mausoleum System," alike satisfying to all that is said against cremation and preventive of the recognized dangers of inhumation.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK FOR THE YEAR 1889. 8vo, pp. 514. Edited by FREDERICK C. CURTIS, M.D., Secretary. Published by the Society, Albany, N. Y.

TRANSACTIONS OF THE NEW YORK STATE MEDICAL ASSOCIATION FOR THE YEAR 1888. 8vo, pp. 618. Edited by ALFRED LUDLOW CARROLL, M.D. New York : I. H. Vail & Co.

These two portly and well-gotten-up volumes of a single year's work of the medical profession of the State of New York are significant of the rivalry that exists between the two societies which they respectively represent. Either one greatly excels what both ever did in any one year united under the sluggish auspices of the State Society, before the unethical contention and final offshoot, five years ago, of the membership which proceeded to constitute the rival association.

Unfortunate, therefore, as the division may appear to be in the causes which led to and still maintain it, it is clear to all who have carefully watched the results thus far that there has never been a corresponding period so fruitful in medical progress in the State of New York as that which is marked by the existence of these two rival societies.

The quality of material in these volumes, respectively, is abundantly worthy of its painstaking presentation.

The inaugural address of Dr. Samuel B. Ward, President of the State Society, has already appeared in full in our pages, as also the report of the Committee on Hygiene. Of the thirty-six other special contributions, besides the reports of committees, in this volume, the following may be named as indicative of the scope and character of the work : The Etiology of Croupous Pneumonia, by George M. Sternberg, M.D., U. S. A. ; Prevention and Treatment of Typhoid-fever, three papers, Drs. Stephen Smith Burt, Eugene Beach, and Simon Baruch ; Acoustics of the Human Chest in Physical Diagnosis, by James R. Leaming, M.D. ; Rules for the Management of Cardiac Dilatation, based on its Etiology, by Alfred L. Loomis, M.D., LL.D. ; A Clinical Study of Alopecia, by L. Duncan Bulkley, M.D. ; A Contribution to the Surgery of Cerebral Tumors, by Lewis S. Pilcher, M.D. ; Considerations Concerning Extraction of Hard Cataract, by Henry D. Noyes, M.D., etc. The number of members in attendance was 179, and of invited guests, 72.

Officers for the ensuing year : President, Daniel Lewis, M.D., New York ; Vice-President, Alfred Mercer, M.D., Syracuse ; Secretary, Frederick C. Curtis, M.D., Albany ; Treasurer, Charles H. Porter, M.D., Albany.

Of the State Association, the striking contributions are : The President's Annual Address, the Medical Profession and the Public, by John Cronyn, M.D. ; Discussion on Nosography, introduced by Alfred L. Carroll, M.D. ; Diphtheritic Paralysis, by J. Lewis Smith, M.D. ; Address on Surgery, by William H. Carmalt ; Railway Injuries, by Charles W. Brown, M.D. ; Address on Medicine, by John Shrady, M.D. ; Address on Obstetric Medicine, by George T. Harrison, M.D. ; Discussion on Puerperal Septicæmia, introduced by Carlton C. Frederick, M.D., etc. Fellows in attendance, 157 ; delegates from other medical organizations and invited guests, 11.

Officers for the ensuing year : President, William P. Lusk, M.D., New York ; First Vice-President, S. H. French, M.D., Amsterdam ; Second Vice-President, R. C. McEwen, M.D., Saratoga Springs ; Third Vice-President, Ellis Lester, M.D., Seneca Falls ; Fourth Vice-President, Thomas D. Strong, M.D., Westfield ; Secretary, E. D. Ferguson, M.D., Troy ; Treasurer, J. H. Hinton, M.D., New York.

Contributions to American Educational History, Circulars of Information: No. 4, History of Higher Education in South Carolina, with a Sketch of the Free School System, by Colyer Meriwether, A.B., Johns Hopkins University; No. 5, Education in Georgia, by Charles Edgeworth Jones, of Augusta, Ga.; No. 6, History of Education in Florida, by George Gary Bush, Ph.D.; No. 7, Higher Education in Wisconsin, by William F. Allen and David E. Spencer, University of Wisconsin.

We have before had occasion to notice this praiseworthy undertaking of the Bureau of Education (Vol. XXII., p. 370), in bringing to light the primitive work toward the establishment of the systems of education which now obtain in the several States of the Union. No one interested in the promotion of education can read these essays without an increased reverence for the fathers of the Republic who, from the outset, showed themselves so much alive to the importance of providing for the education of youth, by the appropriation of means and the organization of societies to that end. State school funds and systems are shown to have had their forerunners in colonial and territorial societies, and special provisions, which, considering the circumstances, are remarkable for their facilities; and the histories of them, as presented in these circulars, should serve to stimulate interest and effort to emulate the example, proportional to the greatly increased ability and *necessity* which now exists.

The abrupt addition of several millions of an almost wholly uneducated race, rapidly increasing, to the privilege of citizenship; and the continuous accretion to the population by the least educated portion of foreign nations, endowed with like privilege on short tutelage, are conditions well worthy the attention of all educators, political economists, and statesmen. Surely there never was a nation, or a period in the history of any nation, to which the necessity for increased facilities and *inducements* for acquiring education was more imminent than it now is in the United States.

By greatly increasing the facilities for acquiring education; by enlarging the powers of the Bureau of Education so as to greatly increase the dissemination of circulars such as these before us, and others written by the best educators and most

accomplished political economists, showing the benefits of education in its most enlarged sense, and by making political and civil privileges conditional on its acquirement, such advances in education would probably ensue as have hitherto been looked for in vain, as they will continue to be so long as there are no inducements for its possession.

A MANUAL OF INSTRUCTION FOR GIVING SWEDISH MOVEMENT AND MASSAGE TREATMENT. By Professor HARTVIG NISSEN, Director of the Swedish Health Institute, Washington, D. C. ; Late Instructor in Physical Culture and Gymnastics at the Johns Hopkins University, Baltimore, etc. 12mo, pp. 135. Illustrated. Price, $1. Philadelphia : F. A. Davis.

This is a concise and useful manual of the subject of which it treats, well calculated to be of use to most medical practitioners who would direct its application, and to nurses who would make themselves familiar with the process in the care of cases not deemed subjects for treatment in institutions specially devoted to it.

MEDICAL AND SURGICAL REGISTER OF THE UNITED STATES. We are gratified at being able to announce that a second edition of this useful work will be forthcoming at an early date. It will contain a list of the physicians and surgeons in the United States, arranged alphabetically, also arranged by States and cities or towns showing school practised, date and college of graduation, post-office address, with population and location.

Lists of existing and extinct medical colleges in the United States and Canada, with location, officers, number of professors, lecturers, demonstrators, etc., the various medical societies, hospitals, sanitariums, asylums, and other medical institutions, boards of health, a synopsis of the laws of Registration and other laws relating to the profession in each State, medical journals, with names of editors, frequency of publication, and subscription rates, official list of officers of the medical departments United States Army, Navy, and Marine Hospital service, roster of examining surgeons of the United States Pension Department, a descriptive sketch of each State and Territory, embodying such matters as location, boun-

daries, extent in miles and acres, latitude and longitude, statistics relating to climate, temperature, rate of mortality, number of deaths from consumption, etc., the names and locations of all the best known mineral springs, full particulars of all national associations and societies relating to medicine and surgery. Subscription price, $5. To non-subscribers, $7. Philadelphia, Pa.: R. L. Polk & Co., Publishers.

TRANSACTIONS OF THE LOUISIANA STATE MEDICAL SOCIETY, 1888, pp. 308. About half of this volume is taken up with the Address of the President, Professor Joseph Jones, M.D., on the "Philosophical Principles of Education and their Scientific Application to the Development and Perfection of Medical Science," less than two pages of which is devoted to hygiene, though conceded to be an important branch of medicine. Excepting this and a report by Professor Jones on (H. B. 1526), "To Prevent the Introduction of Contagious and Infectious Diseases, and to Establish a Bureau of Health," which is condemned, the rest is wholly devoted to curative medicine.

TRANSACTIONS OF THE NEW HAMPSHIRE MEDICAL SOCIETY, 1888, pp. 182. Of the contributions to this volume, two are especially worthy the attention of sanitarians: "Consumption in New Hampshire," by Irving A. Watson, M.D., Secretary of the State Board of Health, which we have before had occasion to notice (February number), and "Milk, and Some of the Things which Affect It," by Frank Blaisdell, M.D. This last, and the discussion upon it, embracing the effect of nursing by diseased mothers, the substitution of cows' milk, the relation of cows' milk to the condition of cow-stables and the health and food of cows; the importance of the utmost cleanliness of dairy and milk utensils, the effect of temperature on milk, and the development of tyrotoxicon and its dangers, are questions of abiding interest to all physicians and sanitarians. The opening address by the President, Samuel W. Roberts, M.D., indicating excessive specialism as a possible means of encouraging quackery, and suggestions for counteracting it; and "Medicine *v.* Nature," by Paul A. Stacpole, M.D., both contain wholesome truths on preventive medicine, eminently worthy the consideration of all educated physicians.

TRANSACTIONS OF THE AMERICAN DERMATOLOGICAL ASSOCIATION, 1888, is a pamphlet of eighty-seven pages, containing several excellent papers on important subjects by the most accomplished physicians in this specialty. Boston: G. H. Tilden, M.D., Secretary.

PAMPHLETS, REPORTS, REPRINTS, ETC., RECEIVED.

"Digestive Ferments." Parke, Davis & Co., Detroit.

"Proceedings of the Quarantine Conference," held in Montgomery, Ala., March 5th–7th, 1889.

"Rational Method of Preventing Yellow-fever on the South Atlantic Coast." J. C. Le Hardy, M.D., Savannah, Ga.

"Air, Its Uses and Abuses. How Perfect Ventilation can be Secured Under all Circumstances." Henry A. Gouge, New York.

"Annual Report of the Superintendent of Public Instruction." Brooklyn, N. Y.

"The Heating and Ventilation of the Mansfield Schools and Churches." R. Harvey Reed, M.D., Mansfield, O.

"Annual Report of the Friends' Asylum for the Insane." Philadelphia, 1888.

The Preferable Climate for Phthisis." Charles Denison, M.D., Denver, Col.

"Opinions on Cremation." The United States Cremation Company, New York.

"Acoustics Applied to the Human Chest in Physical Diagnosis." J. R. Leaming, M.D., New York.

"Early Diagnosis of Ectopic Pregnancy." Horace Tracy Hanks, M.D., New York.

"Pregnancy Complicated by Uterine Tumors." H. T. Hanks, M.D., New York.

"Secondary Mixed Infection in some of the Acute Infectious Diseases of Children." Bayard Holmes, M.D., Chicago, Ill.

"The Germ Army—How it may be Routed." A. Arnold Clark, Lansing, Mich.

"Opening of the New Building of the Howard Hospital and Infirmary for Incurables. Philadelphia, Pa.

"Law Establishing the State Commission in Lunacy." New York.

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THE CHIEF REQUIREMENTS OF HEALTH, WITH ILLUSTRATIONS OF THEIR PRACTICAL APPLICATION.*

By WILSON NOBLE, M.P.

WITHIN what may be called, comparatively speaking, modern times, we find death prowling through our crowded cities, and even our country homes, striking down with one hand the strong man in the prime of life, and with the other the woman and her little child, unchecked and unheeded, because the people did not know the cause of his coming, and, consequently, were unable to take precautions against his ravages. We have to ask if we are making progress? A few figures will, I think, show we are. The death-rate per thousand in the years 1660–79 amounted to 80 (plague and fire); 1681–90, 42.1; 1746–55, 35.5; 1846–55, 24.9; 1871, 22.6; 1887, 18.8. In London, in spite of its size and densely-packed population, the death-rate is only 19.6. It is to the present century that we must look before we find any serious steps being taken on the part of the Legislature to insist upon more sanitary conditions being established. It is not my intention to recommend any particular legislation, because I do not wish to enter upon any matter of a controversial nature, as the President's addresses at this Congress are not subject to discussion. I think I shall better fulfil the duty which I have been called upon to undertake if I limit my remarks to a brief historical summary of past and present legislation, considering the defects in our present system, and inquire how far it is possible to remedy them. Now the chief requirements of health are:

* Address before the Health Congress at Hastings, England, April 24th, 1889.

1, water-supply, pure and plentiful; 2, fresh air circulated by ventilation; 3, removal of sewage by adequate drainage; 4, general cleanliness.

How far have these been insured by legislation, and can we look to legislation to insure them in the future? Before you can expect Parliament to move in the matter you must show that these things are necessary. The great obstacles to sanitary improvements are ignorance and poverty. I do not mean to imply that these are synonymous terms, so as to make them to appear as one cause, but as two entirely distinct causes of insanitation. In other words, I do not mean to imply that the poor are necessarily ignorant. As to the removal of the first of these obstacles—ignorance—it is being rapidly dissipated. We have fortunately within our midst many men who have devoted their lives to sanitary science—men who are daily educating us and showing us how we may make our towns healthier, and our houses more wholesome; and consequently how we can prolong our lives, and protect ourselves against sickness and disease. These men are striving to attain a definite goal—the amelioration of the mental and physical condition of mankind. At present the death-rate throughout England is 18.8 per 1000. Looking back a hundred years, this is a very considerable reduction. Though we have been able in the last two decades to reduce the death-rate about 4 per 1000, this reduction implies a greater progress than the figures will at first sight warrant. It shows that we possess a greater power of contending with the forces of disease than we had in the past, because the natural causes of insanitation are on the decrease. There is a strong tendency for people to congregate in towns, owing to the necessity of finding work. If people, having reached the towns, were able to find clean, healthful, and roomy dwellings, the result would not be so detrimental to health, as it is not the size of the town which produces unsanitary conditions, but the density with which the population is packed. If, therefore, we could increase the areas of towns in proportion to the increase of population, we should very materially reduce the tendency to sickness, and consequently the death-rate. But, unfortunately, the bulk of the people who flock into the towns go there for the purpose of obtaining work, and must live near their work,

consequently producing all the evils of overcrowding, about which I shall have something to say presently. Therefore, though the death-rate throughout England continues slowly to decrease, yet the progress of sanitary science is rapid; though the workers are few, yet are they earnest and energetic. They are daily acquiring knowledge, enabling them to cope with the ever-growing causes of disease, and they as rapidly distribute it; and if more towns were to hold congresses similar to this, where the people would have the advantage of learning what is necessary to the requirements of health, and, at the same time, instructing us who are in Parliament, and showing us where our responsibility lies, we should more rapidly reach the haven for which we are steering. This can, however, only be done by perseverance and patient labor, by allowing no prejudices to interfere with progress, but by believing that those who have devoted their lives to a particular science must at least know as much about it as those who have persistently ignored it. So much for the removal of ignorance, which, I trust and believe, is but a matter of time. As to poverty, that cannot be so readily removed; the poor we have always with us, and always shall have. So we must endeavor to ameliorate their condition. They are largest in numbers, and consequently the greatest sufferers, and are surrounded by more unhealthy conditions. It is true that at one time there were advocates of the Malthusian theory—by which it was hoped that death from disease would remove the surplus population in overcrowded districts; I say "were," because I believe very few of its advocates exist at the present day. Pestilence as a check on population has now been proved to be no check at all, for, instead of reducing population, it merely leaves it more sickly and enfeebled. In unhealthful localities, such as the slums of London, where epidemics run wild, the usual interval between births is one year, against two years in the more heathful agricultural districts, owing, no doubt, to the fact that in the latter case the mothers nurse their own children, and in the former they do not. This increase in the birth-rate, therefore, compensates for the increase in the death-rate, the net result being that the unhealthful condition of a locality does not reduce the population. I am inclined to regard the

as one of the burning questions of the day, and one which demands our serious consideration, both on account of its importance, not to the poor alone, but to the whole community, and because it is, at the same time, one most difficult to solve. Those who have studied the report of the Royal Commission on the Housing of the Working Classes will, I think, wonder, not at the high rate of mortality in our large towns, but at the comparatively low rate, considering the awful condition in which some of our people live. Lord Shaftesbury, who spoke with sixty years' experience, said that however much the condition of the poor had been ameliorated in other respects, the overcrowding was becoming more serious than ever. In some of the central parts of London, as in the neighborhood of St. Pancras, overcrowding had not increased, simply because the locality was so full that it could hold no more. In many parts it is unusual to find a family occupying more than one room. Until the report of the Commission was published, very few people had any idea of what was taking place within a mile of their own doors. In one case we find a family of nine persons, five of whom are grown up, occupying a room 10 ft. + 8 ft.; two families in one room 12 ft. + 8 ft.; seven persons in a room 12 ft. + 6 ft., and only 7 ft. high; a father and mother are found occupying a room 10 ft. + 5 ft., with four children. Overcrowding also exists in provincial towns, and though in some places extremely bad, cannot compare with London in its worst parts. In Newcastle-on-Tyne, one hundred and forty families were found in thirty-four houses, each consisting of four rooms and two cellars. In another case fifty houses with two hundred and thirty families; and in another, sixty-two houses, three hundred and ten families. Instances are given at Camborne, in Cornwall, where seven, eight, nine, and even ten and eleven persons were found living and sleeping in one room. In Birmingham, another kind of overcrowding was noticed before the improvement schemes were carried out; that is to say, of crowding a large number of houses on to a limited area, the rooms of the houses not being occupied by excessive numbers of persons. Overcrowding is invariably accompanied by many other evils, injurious

alike to health and morality, such as structural defects, bad drainage, and bad ventilation ; but setting these aside for a moment, overcrowding has been found to be injurious in itself. Sir Edwin Chadwick has shown that there was an excessive death-rate in single-room tenements, a lower death-rate in double-room tenements, and a still lower rate in three-roomed tenements. In parts of London it was found that even where there was no outbreak of epidemic the death-rate in one case was 44.4, another 53.7, and in another as much as 70.1 per 1000. As has been pointed out, overcrowding is an ever-growing evil, because the causes which produce it are ever on the increase, and themselves are productive of fresh causes. We have first the general migratory tendency toward the towns. The workman, having reached the town, is compelled to be as near as possible to his work, or if not in regular employ, to be in such a neighborhood that he could readily get to work should any offer itself. Sometimes work may be obtained provided the workman can get to it by 6 o'clock the next morning. A colony of poor beings thus formed, it is necessary to feed them. The usual shops are too expensive, by degrees are closed, and become occupied by other families, and costermongers supply the necessaries of life more cheaply than the shopkeepers, and in their turn add to the evils of overcrowding, for they are bound to live near the place where they find a ready market for their goods. Then the houses become old and dilapidated and have to be removed. A street improvement scheme is floated, and scores of homes are demolished—not one moment too soon ; but, unfortunately, while the new homes are building and the streets being opened, the poor are still more densely packed in the remaining houses. Though the building improvements, no doubt, confer inestimable benefit on the locality at large, yet while they are in course of progress, they inflict most cruel hardships on the poor in the immediate neighborhood. Nor is this the whole of the evil. The dwellers in these crowded parts become enfeebled by sickness and their poisonous surroundings, and are unable to do the same amount of work as they could do when they first came to town. The contractors consequently advertise for men from the country, who, fancying that the demand for labor is greater than the supply, flock up to town

with their families to obtain work, thus adding to the already too dense population, and in their turn becoming sickly and feeble, only to be replaced again by fresh supplies from the country. The people being obliged to live near their work, they are compelled to pay almost any rent demanded, and this precludes the possibility of their occupying in many cases more than one room. The rents, too, are increased by the middle-men, the freeholder having in many cases but slight direct interest in the welfare of the occupiers. He usually inserts clauses in the lease compelling the tenant to keep the house in repair, but he often is unable to insist upon these repairs being carried out, because he knows that if he did, the already exorbitant rent charged by the middle-man would be still further increased. That the rents charged are exorbitant may be seen from the fact that some of the middle-men or house jobbers, as they are called, obtain as much as one hundred and fifty per cent profit. I do not wish to discuss the breaking up of the large estates, which is advocated by some as a remedy for these evils, because the question of the enfranchisement of leaseholds is a current political topic. I think, however, it should not be forgotten that some one would have to be landlord, the poor being unable in most cases to own their own houses, and it is a question whether overcrowding would be reduced by replacing the large landlords by the present middle-men. Among the accompanying evils of overcrowding may be mentioned insufficient water-supply, bad drainage, bad ventilation, and structural defects. In many of the large tenement-houses there is a single water-supply, which, not being constant, is drawn off at certain hours of the day, and kept in tubs in the sleeping-rooms ; or if there is a cistern, it is often outside in the sun, and uncovered. Those who travel to town may often have noticed the open cisterns in summer covered with green growth of rank water slime, which, if examined even in the most careless manner, would be found to be teeming with animal life. This water, when it holds out, is used for drinking and all domestic purposes. One very necessary reform I hope we may shortly see carried out is the purchase by the localities, metropolitan and provincial, of all water companies, a constant supply being enforced, thus abolishing cisterns, which are more often traps

to catch any passing disease than containers of pure and wholesome water. But the water supplied must be pure and wholesome, for there is no more ready vehicle of disease than water. It has been shown, over and over again, how epidemics have arisen from contaminated water. Very frequently it is drawn from a well near a leaky cesspool or drain. Persons have taken typhoid-fever when contaminated water has been used for washing milk-cans. As water is such a willing carrier of disease, the fact should be utilized for our advantage, and not to our destruction. As science grows, our power, not of controlling, but of utilizing the laws of nature, increases. Our present knowledge enables us to use it to our advantage by conveying all impurities from our houses ; and yet, for the most part, we only allow it to bring them to us. It is within our power to obtain pure water. Let us have enough of it to carry off to the sea, or into the porous earth, which is an equally effective purifier, all our refuse and dirt. But the source of water must be plentiful and pure. Nature grants us this, but again we have abused her gifts. Look at our great rivers, and contemplate what they were, and what we have made them. We have means to-day of distributing sewage over the face of the earth, where it was by nature intended to be placed, to nourish and improve the growth of the plants we require. Instead of this, we pour it into our rivers, where it is washed backward and forward by the tide, contaminating the water, and not only making it absolutely unfit for use, but converting the river itself into an open cesspool. I venture to think that there are many less useful questions brought before Parliament than that of the disposal of sewage, and the purification of rivers. Air, as well as water, is essential to the well being of the community, but the air must circulate, or it soon ceases to be pure. It is, however, not my province to dwell upon any particular methods of ventilation even were I competent to do so, except so far as the action of the Legislature may prevent or assist the access of air to dwellings. Air is the common property of mankind, and no one should be allowed to deprive his neighbor of it by the erection of buildings in such a manner as to cut off the supply. By the Buildings Acts every house is obliged to have a certain amount of air space back and front, but in many cases these regula

tions are wholly disregarded. Houses are built back to back, or are separated by narrow alleys, the centre of which is often little better than an open drain into which the filth from the houses is thrown, contaminating the air before it reaches the windows. Air, like water, is a great destroyer of impurities, and consequently a powerful deodorizer. I remember an old friend of mine in the medical profession saying that the chief use in disinfectants was that they made such a smell in the room as to compel persons to open their windows and admit fresh air. Structural defects, too, are often the cause of much sickness. It too often happens that houses are built of the commonest materials, and put together with the worst workmanship. The drains very shortly become leaky and dangerous, and the houses, even were they not overcrowded, would be wholly unfit for habitation.

The law seems tolerably satisfactory if we regard its provisions and not its results. But it is to the results that we must look, and if we ask why they are not more satisfactory, we shall find that one reason is the indifference on the part of the inhabitants to the requirements of sanitary regulations. But in the more crowded towns, both metropolitan and provincial, there exists one great difficulty. If you provide the people with a sufficient number of rooms to meet the requirements of decency and health, and if these dwellings are provided with the necessary sanitary conveniences—if, too, they are to be built in such a manner as to ensure perfect ventilation and prevent overcrowding, one of two things must result. Either the occupier must pay more rent, or the builder or landlord, as the case may be, must forego his interest on his outlay. If the latter, the result will be that the houses are not built at all. On the other hand, can the working classes afford to pay more than they do at present? Under the present conditions, I think not; but under other circumstances, I think they can. We have already seen what an exorbitant profit the middlemen sometimes make. You can, therefore, do away with him, or place him under such stringent regulations as to prevent him letting lodgings in an improper condition. You cannot pass an Act of Parliament to say what rent a man shall pay, but you can enact that men shall not pay rent for dwellings that are unfit for habitation. We will suppose, then, that by

means of legislation and inspection, we have places that are fit homes for the workingman. Can he afford to pay such rent as will give a fair return on the outlay, even though it should be higher than is at present paid? If we consider what he gains in return, we shall see that he can. Overcrowding and unhealthful dwellings produce debility, weakness, and exhaustion, rendering the poor particularly subject to sickness and disease. It has been found that at the lowest estimation every workman loses twenty days in the course of the year from exhaustion alone. Not only do those surroundings deprive a man of a certain number of working days, but they of necessity shorten his life. If, therefore, you can give a man such a home as to prolong the average span of life, you are surely giving him something that will be worth paying for. Not only does he gain strength, enabling him to work a larger number of days in the year, and so earn more wages, but you are also adding to the number of years during which he can work; and as you reduce the likelihood of premature death, so you reduce the premium of insurance. There are many items, therefore, in a poor man's expenditure which might most advantageously be devoted to a higher rent without increasing his expenditure as a whole. It may be said, and with great justice, that a workingman who is in regular employ might regard a higher rent for better dwellings as a good investment, but there are thousands below the regular wage-earner who have nothing to invest, and who cannot pay increased rent, no matter what advantages they may gain in doing so—in fact, often he can pay no rent at all. It is here where the real difficulty lies; and the question remains: To what extent are the Government called upon to find homes for these people? I think some steps might be taken by municipal or county authorities, backed up by an Act of the Legislature, if possible, to invest money in the

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and other places where overcrowding and its unhealthful surroundings become a danger to the community at large. If I regard this for a moment from a monetary point of view, as I have done in the case of the individual, it is not because I

consider this its most important aspect, but I do so, first, because the advantages of promoting the health of the body politic are so obvious as not to need insisting upon, and to prove, if possible, to those who might object to any increased outlay of public funds, that they are not wasting their money, but investing it to a good purpose; that, though they may appear to be casting their bread upon the waters, they will inevitably gather it again where they least expect it. It should, however, not be forgotten, as I have already pointed out, that county councils have the power of erecting and controlling laborers' dwellings, charging such a rent as will give a fair return; but the enormous cost to them and the Trustees of the Peabody Fund have hitherto greatly checked their undertakings. It is very desirable that public bodies should be encouraged to build as much as possible, as they are naturally satisfied with a smaller return than a contractor, who builds solely for profit. I have it on the authority of my friend, Sir Lyon Playfair, that there are every year one hundred and twenty-five thousand deaths in this country from preventable causes. The investigations of Pettenkofer have shown that there are thirty-nine cases of serious sickness for every death; therefore we have annually four and one quarter million cases of preventable sickness; and as these cases last on the average eighteen and one half days, irrespective of the twenty days mentioned before, we lose annually more than seventy-eight and one half million days' labor, which, at two shillings a day, represents a loss of over seven and three-quarter millions sterling. Surely, therefore, putting it on its lowest ground, it would be an economy to adopt sanitary measures, and an excellent investment for the localities to make. It is open to doubt whether you can appraise at any money value the life of an individual, but you may fairly compute money which will be saved by a proper outlay for sanitary purposes. To show what has been done in the way of saving life where sanitary improvements have been undertaken, I may mention that, after the defects in the sewage of Salisbury had been remedied, the deaths from phthisis fell forty-nine per cent; at Ely, forty-seven per cent; Rugby, forty-three per cent; and Banbury, forty-one per cent. What we also want is a thorough and efficient

and localities which are in an unsanitary condition. I have endeavored to point out that the legislation is satisfactory, but that where it breaks down is in the want of knowledge obtainable. I know that too close inspection is repugnant to our feelings, but we often have to submit to things we dislike for the public good, and you can only remedy sanitary defects when you have knowledge of them, and this knowledge can only be obtained, like other knowledge, by seeking it. We are often told the Imperial Parliament is omnipotent, and can pass what measures it will. But there is in existence a code of laws which are older than the Parliament itself, which are more immutable than those of the Medes and Persians, which are inexorable in their execution, and which are enforced by the terrible sanction of sickness and death. These are the laws of nature. You may make what regulations you like by means of your Imperial Parliament, but unless they are done in accordance with the laws of nature, they are worse than useless. Nature is not a hard taskmaster, because her ways are clear and well defined. She does not act in one way to-day and in another to-morrow. You may repose the fullest reliance in her promises, knowing full well that as she has acted on one occasion, so she will act again under similar circumstances. Some of these laws are known to us, others have as yet to be discovered, but are daily being revealed and placed at our disposal. We cannot always act in accordance with laws that we do not know, but do we always obey those which we do know? If we did, we should be relieved of much sickness, and its accompanying misery. It might be thought from what I have said that it would be useless to pass any measures of sanitary legislation, for nature will have her way in spite of you. If these measures were conceived in a spirit of antagonism to nature, they would be useless, or worse than useless, and you may depend upon it that where pestilence has visited a locality, or where there has been an abnormally high death-rate, it will be found that nature's laws have been disobeyed. If, therefore, your legislation is to be of any avail, it must have for its object the utilization of nature's forces. There are constantly moving about in our atmosphere myriads

of disease germs, seeking, as it were, places where they can obtain a foothold. If our homes are clean and well ventilated, they will pass harmlessly by; but if they find any decaying matter upon which they can settle, they will certainly do so, and we pay the penalty. Let us, therefore, once and for all recognize the vital importance of living in a perfectly sanitary condition. We may be able to a certain extent to bring this about by legislation, but legislation is of no use unless it is enthusiastically and intelligently carried into effect by the people it is intended to benefit. Whatever this legislation be, let it follow, and not seek to drive the forces of nature. When we have done this we shall reap our reward in increased comfort, a diminution of sickness and disease, and a lowering of the national death-rate. We shall obtain blessings greater even than prolongation of life, which, without health, is often a curse rather than blessing. Give a man health, and you give him something more to be desired even than length of days. You give that which alone makes life enjoyable or even bearable—you give him contentment and happiness.

> "Nor love, nor honor, wealth. nor power
> Can give the heart a cheerful hour
> When health is lost. Be timely wise;
> With health all taste of pleasure flies."

Graveyards in London.—By a recent return from the Home Office, dealing with the subject of metropolitan cemeteries, it appears that of the twenty-three cases which have fallen within the scope of the inquiry, the City of London and Tower Hamlets Cemetery, Mile-end, leads off with a ghastly tenantry of some two hundred and forty-seven thousand bodies, while All Souls', Kensal Green, occupies the largest area, comprising some sixty-nine acres, and also enjoys the priority in respect of age. As regards the space allotted for each grave, some disparity is observable, nine feet by six feet six inches being the maximum limit. The common interment system is very general, it being, for instance, the practice in some districts to bury as many as eight to ten adults, or twelve children and grown-up persons mixed, in a common resting-place.

THE THERAPY OF OCEAN CLIMATE.*

By ALBERT L. GIHON, A.M., M.D., Medical Director, U. S. Navy.

THE elements of ocean climate are necessarily few. A superincumbent atmosphere free from impurities in proportion to the distance from land, with a temperature of very limited range through the absence of local disturbing agencies, and having diffused through it a correspondingly uniform amount of aqueous vapor. Nowhere over the ocean does the mean daily fluctuation of the temperature of the surface quite amount to a degree. The temperature of the atmosphere has a rather wider range than that of the sea on which it rests, but this is very much less than anywhere on the land.

Only the weeds of the Sargasso Sea enjoy perennial abode among these simple climatic conditions. The longest passages of sailing vessels seldom extend beyond two or three months. Were they years long, the monotony would pall upon the voyager and make him sigh for the green fields and sandy plains of terra firma with all their unwholesome smells.

Next to the transitory exposure to ocean climate in the course of a sea-voyage is the residence on some small mid-ocean island where there are few vicissitudes of weather, short range of temperature, and none of the physical befoulments from masses of men and animals or decaying vegetable matter. Here, even better than on shipboard, is to be found the opportunity for making ocean climatic influences available as curative measures.

The therapeutic uses of climates, as of drugs, are to be inferred from their physiological or pathogenetic effects. What is the influence of life upon the ocean on the well man-of-the-sea? He is of two orders: One, the merchant sailor, who begins his career after the land-shark has left him penniless, debauched, and diseased; who is kennelled like a brute in a

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gloomy, filthy, unventilated forecastle, is ill-fed, scantily clad, maltreated, and overworked. What of value can be learned from his physical history beyond the general fact, that such as survive come into port after a long voyage, notwithstanding the sparse fare, exposure, dirt, neglect, and ill-usage, still strong and vigorous? Though much of this is due to a certain enforced regularity of life and the interrupted sacrifice of health at the shrines of Bacchus and Venus Porcina, much is also due to the invigorating influence of protracted exposure to sunlight and pure air in their out-door work.

Of the better class of the men-of-the-sea—the man-of-war's-man—we might expect to learn something more definite. He, too, is recruited from the slums of the shipping quarters, but he is required to be clean, sober, and absolutely free from disease when enlisted, and after that is well fed, clothed, and treated, so that his medical history may be assumed to give some indication of the causes of disease to which he has been subjected; but the medical returns of the various naval services are chiefly summaries of the cases of disease and injury treated, arranged, so far as the British and American navies are concerned, under the customary nosological classification of the London College, and consequently, indicating but little as to the precise first causes of these diseases, whether contracted during visits on shore or developed *ab origine* in well men during their sojourn upon the high seas from causes there in operation. The rheumatism of the syphilitic, for which Neptune cannot be blamed, and the rheumatism of bad weather, which is a very decided salt-water affection, usually go into one class to swell a common total. The pulmonary phthisis for which an ancestor is responsible and the phthisis which the foul, damp air of the unventilated berth deck has developed are undistinguished, though only the latter is of statistical interest as a product of ocean pathogenesis. The fact, too, that naval medical returns include those of the naval establishments on shore as well as those afloat, prevents the identification of the strictly nautical affections, but, notwithstanding this, it is interesting to note in the last published report of the Surgeon-General of the Navy of the United States, that among a total of 8550 admissions of sick and disabled officers and men of the Navy and Marine Corps, nearly

ninety per centum were included in the following few classes, to wit :

Casualties	1917
Venereal diseases	1071
Diseases of the integument	888
Malarial and other fevers	888
Affections of the nervous system	489
Diarrhœal affections	483
Rheumatism	521
Inflammatory affections of the respiratory tract.	1149

the remaining 1144 being distributed over a wide range of titles, of which many, as adynamia, cephalalgia, constipatio, odontalgia, etc., have no special significance. It is probable that only about one fourth of the cases of disease occurring at sea are attributable to any of the circumstances of oceanic life, and these are almost entirely inflammatory affections of the air passages and intestinal tract, neuroses including nausea marina, and rheumatism.

It is evident there is no saving balm in salt water, which hardens the sailor against aching muscles and swollen joints, and such of their ailments as are not the results of exposure to vicissitudes of weather are caused by decks needlessly wetted for cleaning, and the overcrowding of their badly ventilated quarters—but this is man's work, not nature's. While these are characteristic affections of the men that follow the sea, these complaints are not in any sense climatic, but due to the occupation of the seaman and to local unsanitary conditions, and the greater proportion of them are avoidable. Consequently, they have no bearing upon ocean climatic therapeutics, which does not comprehend exposure to bad weather, wet and overcrowded decks, or exhaustive labor upon sails and anchors.

What, then, since there are so few causes of disease in operation, may the seeker after health hope to gain by a sea-voyage or by prolonged residence on some ocean island where all the conditions of sea-life prevail ?

First, if season, course, and destination be judiciously chosen, the invalid will obtain, on a long voyage, in a comfortable sailing vessel, *rest*—of mind and body—a condition of

absolute insouciance, and relief from the cares and distractions, the daily worries and anxieties of life, the interruptions and noise and turmoil and excitements which railroads, telegraphs, and newspapers bring into the very sick-room on land.

If not so completely bed-ridden (in which case he probably ought not to go to sea at all) but that he can lie in an easy chair on deck, he will be able to breathe and bathe in an air that is barren of every impurity, and with every inspiration experience a sense of pleasurable invigoration.

If sea-sickness is not an indomitable idiosyncrasy, as I have known it to be even in captains of the navy, he will, after a few days, when he "gets his sea-legs," as sailors term it, find inexpressible delight in pacing the narrow bounds of the quarter-deck, and lengthen the hours of this gentle exercise until they become whole watches long.

Once accustomed to the motion of the vessel and of the sea, nausea will give place to appetite, which is sharpened as well for old salts as land-lubbers, and the plainest food will be taken with unwonted relish, betokening improved assimilation. If care be had to overcome the usual tendency to constipation, ingestion may go on without restraint. The eagerly anticipated meal-hours become the eventful marks of the passage of time. The whilom patient eats and sleeps, and wakes to find new zest in the simple employments of the day. Rocked in the cradle of the deep, the ocean's lullaby soothes the sufferer into forgetfulness of his ills.

A long sea-voyage in temperate latitudes on board a clean, roomy vessel, well outfitted and equipped, is a judicious therapeusis for chronic invalids of almost every class ; but to be effective the ship itself must be free from the dirt, dampness, and bad ventilation which, under aggravated circumstances, made scurvy, ship-fever, and dysentery actual scourges of sea-life, and in a less conspicuous degree show their effects in the rheumatism, phthisis, and diarrhœa which are needlessly frequent among sailors. Only a clean ship can be a healthy ship, and it is just as axiomatic that a foul ship will develop, breed, and transport disease. The filthy mess in the bilges of old-time men-of-war, where the heresy of naval hygiene was not permitted utterance—the putrid mixture of salt and fresh-water, coal-dust, oil, provisions, and decomposed timber—an

artificial marsh as pestiferous as any miasm-breeding quagmire on land, gave forth emanations which blackened the paint and pervaded the atmosphere, enveloping the ship with a polluted aureole that clung to her through all her course. In those days the scent of bilge-water was considered as inseparable from a vessel as the barnacles on her bottom. If naval medical officers have lacked opportunities for distinction as operators or diagnosticians, they have still fought a good fight and gained a glorious victory in the cause of true medicine in the revolution they have effected in methods of life at sea. Virulent diseases have become extinct, and the heights of sanitary independence have been gained, whence it is possible to point out the weak places through which the enemies of human health gain entrance, and at which their further passage must be prevented.

Under any circumstances, however, a ship is useful only as a temporary expedient. In the often-quoted instance of Collingwood's flag-ship, "which with a crew of eight hundred men was, on one occasion, more than a year and a half without going into port, and never had more than six on her sick-list; this result was occasioned by his system of arrangement and his attention to dryness, ventilation, etc., but above all by the contented spirit of the sailors, who loved their commander as their protector and friend, well assured that at his hands they would receive justice and kindness, and that of their comforts he was more jealous than of his own;" but the circumstances were exceptional, and in the case of confirmed invalids a too prolonged residence on board ship becomes depressing. Hence, stationary hospital-ships are not desirable where local insalubrious influences do not prevent establishing the sick on shore. Gliding over the water day after day with the consciousness of progress and the prospect of an end, however distant, is quite another matter from riding at anchor in a harbor, watching, from a sick cot, green fields and purple hills. There is something, too, in the tonic touch of earth upon one who has been very long ill at sea—some mysterious influence affecting the molecular relations of the human body, which cannot for too great a time be intermitted, so that the therapeutic advantages of cruises are only limited.

The slowly convalescent from whatever disease—from pro-

tracted fever, chronic diarrhœa, nervous asthenia—the incipient pulmonary case, the feeble, fretful valetudinarian, the overworked business man, the broken-down woman, the child with slender hold on life, if sea-sickness is controllable, will, after a few days of pleasant sailing, recover appetite, and often recuperate with marvellous rapidity. The inebriate removed from the temptation or the means of self-gratification ; the not inconsiderable class of cases of sexual exhaustion and of other forms of impaired nervous power ; the thousands of victims of their own follies who fill the sanataria, private hospitals, and health-resorts ; the irritable *malade imaginaire*, and melancholy hypochondriac and misanthrope are especially benefited by the quiet restfulness of a long sea-voyage in pleasant weather, when the assimilative process becomes the dominant function, and the worn brain and flaccid vessels and feeble lungs are beguiled into feeding on what will make them strong again.

Indeed, so serviceable a measure for restoring health ought, ere this, to have led to special provision for accommodating invalids—floating sanataria—sailing vessels by preference by reason of the less rapid transition to higher or lower latitudes, with auxiliary steam power to carry them across calm belts, drive a ventilating fan, operate a dynamo for electric light, and furnish steam for artificial heat and other necessary purposes—vessels provided with every needful convenience, with skilled medical attendance and nurses, and with fresh food, fresh milk, and fresh fruits—no longer problems since the day of refrigerating chambers, milch cows, and live stock. Thirty years ago the harbors of China and Manila, Rio de Janeiro and Valparaiso were crowded with splendid American clippers, whose commanding officers were veritable princes of the sea, and whose elegantly appointed apartments were capacious enough, after housing their families and guests, to allow a spare stateroom or more for some invalid stranger ; but to-day one looks in vain among the great distant seaports of the world for the ensign of an American merchantman, so that there is little opportunity from this country to make long sea-voyages, save for those wealthy enough to own pleasure yachts which can answer the double purpose of sight-seeing and health-seeking. The carrying trade between Great Brit-

ain and Australia, however, requires clipper-built merchantmen of the largest class, whose cabins are nowadays arranged with the very object of accommodating invalids, who have so increased in number that it has been proposed to construct a class of *invalid ships* for their exclusive use ; but there is the same objection to congregating large numbers of sick on board ship as at health resorts or in hospitals, so that if large, well-ventilated staterooms, bath-rooms, good food, and other comforts can be obtained on board a vessel where there are few passengers, the results will be better than upon a regular invalid ship, where the very air is heavy with studied silence, and where ever-present precaution reminds the sick man that he is manacled by disease. The spectacle of pallid, helpless men and women at Madeira and Nice and similar health resorts depresses the well and frightens the ill—as the yellow flag of the quarantined vessel causes all the sick to die and all who can get sick to do so, until every possible victim is reached.

The therapeutic agencies which operate upon the broad ocean—rest, pure air, equable temperature and moisture, and the minimum of disturbing causes, are to be found in almost as great degree on the ocean islets, where the sound of rippling springs, the sight of fresh verdure, and the scent of earth replace the monotony of the horizon-bound disk of water.

These islets are dotted over the sea—numerous in Oceanica, where distance and rare opportunities of communication place them beyond convenient and frequent access—less numerous but easily reached in the Atlantic, where midway between the continents they invite the weary broken-down sufferers in mind and body to find rest and sweet oblivious antidote for all their ills. The Azores, Madeiras, and Canaries are the chief among these "isles of the blest." The former, especially Fayal, about two thousand miles, ordinarily a pleasant fortnight's run from Boston, offer a climate so mild, that one need hardly look for a better, were it not that that better is to be found at Madeira, and a best of all at Orotava on the Island of Teneriffe, one of the group of the Canaries—*Las Canarias* of the Spanish, the *Insulæ Fortunatæ* of Roman geographers, whose mountain peaks stand above the waters like tombstones in this ocean cemetery, where a continent and its millions of Atlantean inhabitants are buried.

The Madeiras are but five hundred miles from the Azores, and the Canaries two hundred farther south, so that the way is easy to that delightful spot, which Humboldt thanked God he had lived to behold—the valley of Orotava, fit garden of another Eden, where he who would begin life anew may find everything save the vice and artificialities and malefic agencies of modern civilization. Twenty years ago I wrote of this spot, what twenty years later I reiterate :

"Here, if anywhere, reigns perpetual spring, without fogs and frosts, where the sap never dies, where rain seldom falls, winds and storm are scarcely known, and burning heat is never felt. Shut off by the high central range of mountains from the hot winds of the African coast, it is yet open to the ocean at the north, from which and the eternal snows above, it derives the moisture that secures its equality. The temperature of Orotava never falls below 50° F., nor rises above 82° F., and only attains these extremes on such rare occasions as when the thermometer marks 108° F. or falls below 0° F. at Philadelphia. Its average for a number of years has been 68.5° F., that of Madeira being 66° F. ; of Rome, 61° F. ; of Nice, 60° F. ; of Pau, 56° F. ; and of Paris, 51° F. ; the first being identical with that of our own delightful autumn days, and that which is the most grateful to the body and most conducive to its well-being. But annual means are unsatisfactory indices ; countries very cold in winter and hot in summer exhibiting a temperate mean, and it is, therefore, necessary to consider the distribution of heat in each month of the year. The monthly means at Orotava have been for

January	62.2° F.
February	62.1° F.
March	64.2° F.
April	64.6° F.
May	69.4° F.
June	73.8° F.
July	76.5° F.
August	73.2° F.
September	71.8° F.
October	69.3° F.
November	68.4° F.
December	68.7° F.

A difference of only 14.4° F. between the hottest and coldest months, while at London this amounts to 26° F.; at Pau, 32.2° F.; Rome, 28.3° F.; Nice, 29° F.; and Madeira, 15.3° F.

"But it is the winter season which most concerns the invalid, and the mean temperature of the five months from November to March, from the fall of the leaves to the opening of the lilies, at Orotava is 64° F.; at Madeira, 61° F.; and at Nice and Rome, 50° F. The February of Orotava is the June of London, the May of Pau, and the April of Rome and Nice and Cannes. Stoves are necessary for comfort in Italy and the South of France; in Orotava they are unknown. Linen garments may be worn the entire year. The Guanches were naked except for the loin cloth, and one can bathe as well on January 31st as on July 31st, while at Nice even the healthy visitor finds it necessary to stipulate for apartments opening to the south and exposed to the direct rays of the sun. There are no sudden variations of temperature at Orotava. There is a fraction over two degrees per month of gradual elevation from the winter to the summer and a corresponding decrease through the autumn, and even these differences may be almost neutralized by removing one's residence from the Puerto on the seashore in the winter to the Villa, a few hundred feet higher, or to any greater elevation on the slope of the Cañadas during the summer. Moreover, the mean temperature of one day seldom differs from that of the preceding more than a degree. On rising in the morning the invalid may be sure of respiring air of the same warmth as on the foregoing day, while the hourly variations of each day are also inconsiderable, the early hours of the morning differing only 6° to 9° F. (at Madeira the difference is 12° F.), from the heat of mid-day, and the most of this occurs before 9 o'clock. At Orotava doors and windows may always remain wide opened, maintaining a perfect equilibrium within and without, the advantage of which cannot be overestimated. Here the invalid may live in the open air—the air of the ocean—which is uncontaminated by the thousand emanations of a large city, his feeble lungs, lightened of most of their labor, mechanically discharging their functions and as much at rest as is possible for organs whose only complete repose is death.

"Nor is temperature the only climatal condition in which Orotava enjoys such sanitary pre-eminence. In point of humidity and exemption from atmospheric vicissitudes it is unequalled by other localities. It rains but forty-five days in the course of the year. At Madeira the average is seventy-three; in Rome, one hundred and fourteen. The mists which bathe the mountain crests, the streamlets that course down their sides from the line of melting snows, the vapors wafted from the ocean, and, when these are wanting, the gentle rains of the winter, furnish that due proportion of moisture which is most agreeable to man and most favorable to healthy life. There is no warring of the elements at Orotava. The barometer stands almost invariably at 30.12 in., and, according to Belcastel, it did not vary a centimetre (0.39 in.) in six months. From February to November a northeast wind prevails, strongest in March, becoming lighter in the spring, to be all summer and the greater part of the autumn only the breath of a zephyr, setting in regularly about 8 o'clock in the morning and moderating the heat of the day. The vapors from the Atlantic are gathered in a thick cloud about half the height of the amphitheatre of the valley, and there held all day, like an immense parasol, intercepting the direct rays of the sun. Days entirely clear are rare, until the gentle rains of the late autumn signalize the disappearance of the clouds and the revival of vegetation. The winter passes without frost, but the white-crowned plateau of the Cañadas, seven thousand feet high, which rims the basin of the valley, and the snow-capped Peak of Teneriffe, towering five thousand feet still higher, denote its presence and add new charms to the landscape. The superiority of Orotava in the matter of hygiene over every other known resort has been set forth by M. Gabriel de Belcastel in his excellent little monograph entitled 'Les Iles Canariennes et la Vallée d'Orotava, sous le point de vue médical et hygiénique,' and his opinion is confirmed by Professor Schacht, of Berlin, in his work on 'Madera und Teneriffa.' Madeira approaches it more nearly, as might be expected from its geographical proximity; but the winter of Madeira is unpleasantly chill, its humidity is greater, and the *harmattan* blows upon it from Africa. Nice and Cannes are toyed by the smiling waves of the Mediterranean, but they sleep at the foot of the Alps, and their awakening air has its home in their

clouds. Naples is visited by keen north winds, coming after the deceitful caresses of the *sirocco* from the Libyan Desert, and at Rome and Florence the cold is sometimes intense, while they are often deluged by rains."

While it may be insisted that these insular sanitaria are of the earth earthy, however small their extent, their climate, for reasons already stated, is strictly oceanic, since their area is but a speck amid the surrounding waters, so that for therapeutic purposes they may be regarded as big vessels anchored for a time where the salt sea-breeze may have unchecked sweep across them. The conditions of equability of temperature, moisture, and electric tension, and absence of ochletic poisoning prevail, here even better than on board the ocean steamship, where there is no escape from the greasy smells of the galley and the machinery, the noise of the engine, and the exasperating clatter of crowds of passengers, or on board the sailing vessel, where the contracted stateroom is apt to be befouled by emanations from the bilges.

At Madeira and Orotava the therapeutic agencies are purely climatic. The air, and light, and heat of the sun are the revivifiers. No drug lends its potency to nature's means. The vicious microbe dies for want of food. If medicinal agencies be needed, as for the rheumatic, venereal, gouty, or dermatosic sufferer, these may be found on the island of Sao Miguel, the largest of the Azores, where intensely cold and boiling waters issue, side by side, from the earth and mingle their tides, sulphurous vapors floating continually from the mouths of the hot wells and from the not inaptly termed *Boca d'Inferno* (mouth of hell), or mud crater, which tosses the semi-solid contents, that seldom overflow, about a circle of forty-five feet diameter. Here there are sulphur and saline springs in a benign climate, where the skin may be kept soft and clean, the emunctories active, the lungs filled with pure air, and the stomach with wholesome food, and if meddlesome man will leave the stopples in his vials, the road to health may be regained all the more quickly. An old friend, himself a physician, who had gone to a famous spring because, like the bewailing Psalmist, there was no health in his flesh nor any rest in his bones, and, perhaps for the same reason, complained to me that he was not allowed to depend solely upon the column of variegated salts and alkalies, which the analysts had strung

out to five and six decimal places, but the resident professional brethren insisted upon supplementing a substantial dosage of iodides and bromides that put to shame nature's own infinitesimals.

So, wise in our own conceit, we stand with minim-glass and milligramme, and measure and weigh with dosimetric nicety what perchance nature only disdainfully rejects through her waste chutes—*per vias naturales.* Is it not time to stop and ask ourselves whether it be not the better part to place our patients where, amid Heaven's boundless supplies, the wiser air-cells, and bloodvessels, and lymphatics may themselves select just what they most require—where pure air and water, and good food, cooked to tempt the palate with half the art in making pretty potions to please both eye and taste, shall be the tonics to regenerate the blood till it revivify the worn-out nerves, repair the wasted tissue, and set once more in healthy play the vital machinery which animates and gives the body being? Mere drugs cannot do this, and drugs needlessly, excessively, wrongfully administered can only retard it. The pharmacist may oftentime be idle, but the therapeutist's task will be no lighter, for climato-therapy requires sound judgment, wise and discriminating adaptation of natural agencies, and the same watchful observation of the grade of action shown by the pulse, the condition of the organic fibre, and the state of the secretions, which are the sum of the physician's duty, however huge his pharmacopœia. If he can preserve tissue from destructive change, keep the emunctories in active play, and control the pulse's fitful beat, he may patiently bide his time for those forces to exert their power, which out of the germinal vesicle make the perfected man—out of the stomach's bole, the blood's living corpuscles, and out of these the sentient flesh and conscious brain. Only the sciolist makes pretence to cure. At our best we are but care-takers. Like children playing with building-blocks, we can pile together a few elements into semblance of organic compounds, but the sublime mystery of the living cell defies us. When we can recognize just where the departure from normal cell-life begins, and shall have learned how to control the process of assimilation, we shall have conquered disease and put under subjection all but the last enemy—*death.—Medical News.*

THE INFLUENCE OF AN OCEAN ATMOSPHERE ON A STAID POPULATION, WITH SPECIAL REFERENCE TO PULMONARY CONSUMPTION.*

By A. N. Bell, A.M., M.D., of Brooklyn.

It is a common criticism on the vital statistics of seamen with reference to the salutary influence of an ocean atmosphere, as related to pulmonary diseases, that the subjects are always more or less selected by special examination, as in the recruiting service of the navy ; or by the limitations of age, in the merchant service. The object of this note is to rebut that criticism by the vital statistics of a staid population of all ages, dwelling under the influence of what may be considered an intensified ocean atmosphere—the trade winds of the tropics, and almost at the level of the sea.

The population selected is that of Turk's and Caicos Islands, comprising an area of one hundred and sixty-nine square miles, situated between 21° and 22° north latitude and 71° and 72° 30′ west longitude. The greatest altitude is an unoccupied bluff of less than one hundred feet ; a considerable portion of the shore is water-logged and swampy ; little or no attention is paid to drainage ; vegetation is scant ; the dwellings are, for the most part, frail structures, almost wholly devoid of sanitary conveniences ; there are no sanitary requirements ; the whole people seem content to depend upon the forcible atmosphere and abundance of sunshine, for both health and the means of livelihood—the dissipation of foul emanations from the soil, and water from the salt-basins.

The following is an abstract of a copy of official records :

For the ten years 1877 to 1886 the average population of Turk's and Caicos Islands has been 4732 ; of this number Grand Turk, the only village, extending about two miles along the shore of Turk's Island, contains about 2000. The average temperature for the period has been 83° F. Range of temperature, 75° to 90°. Strong trade winds from east-northeast to east-southeast throughout the year. The weather is never

* Read before the American Climatological Association, June 24th, 1889.

hot at night, except on very rare occasions, when the wind subsides for brief periods. Rainy weather is almost exclusively confined to March and September.

The registration of deaths for the ten years is as follows :

Deaths registered in Turk's and Caicos Islands during the ten years 1877–1886.

Diseases.	1877.		1878.		1879.		1880.		1881.		1882		1883.		1884.		1885		1886.		Total.
	Turk's.	Caicos.	Turk's.	Caicos.	Turk's.	Caicos.	Turk's.	Caicos.	Turk's.	Caicos.	Turk's.	Caicos.	Turk's.	Caicos.	Turk's.	Caicos.	Turk's.	Caicos.	Turk's.	Caicos.	
Pulmonary	11	14	6	3	5	5	7	8	10	8	7	6	12	8	9	5	12	4	10	5	155
Intestinal	6	1	7	1	1	4	3	9	9	6	6	5	8	4	5	9	8	3	7	9	111
Throat	1	...	1	...	...	1	...	2	...	1	2	1	...	...	...	...	...	2	1	1	13
Scurvy	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1
Urinary organs	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	2	...	1	...	...	5
Smallpox	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1
Dropsy	1	...	...	...	2	...	1	1	1	1	5	3	2	1	2	...	2	1	...	...	23
Leprosy	...	...	...	...	...	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	3
Senile decay	2	3	3	6	9	4	17	13	12	7	13	8	10	4	10	8	10	9	11	6	165
Infants, under 3 years	29	18	13	23	16	18	23	22	15	9	20	9	9	17	18	15	17	13	15	8	327
Fits	2	...	...	1	...	1	1	...	...	...	...	...	1	...	...	...	...	1	1	1	9
Heart	...	...	...	...	2	...	1	...	...	1	...	...	...	1	...	...	...	...	1	...	6
Liver	1	...	...	...	...	...	...	...	...	...	1	...	1	...	2	...	...	...	...	...	5
Scrofulous	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	2
Cancerous	1	2	...	...	1	...	...	1	...	1	1	...	...	...	1	...	2	1	...	...	11
Spinal	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	2
Fever	4	9	...	3	...	6	7	5	6	10	4	10	4	9	3	3	3	8	3	2	99
Paralysis	1	...	1	...	1	...	2	...	...	...	2	1	...	1	...	...	1	...	2	...	12
Rheumatism	...	...	2	...	..	...	...	1	...	1	...	1	...	2	...	...	...	1	...	1	9
Asthma	1	1	...	1	...	...	1	...	1	...	...	...	...	...	...	...	...	1	1	1	8
Palsy	...	...	...	1	...	...	...	1	...	1	1	1	...	...	...	...	1	...	...	...	6
Accident	...	1	1	3	2	...	3	2	5	4	3	3	2	1	2	8	4	1	3	2	50
Syphilis	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	2
Childbed	...	1	...	...	...	...	1	...	...	...	1	...	...	...	3	...	1	2	...	1	10
Total	61	50	35	42	39	40	68	66	60	52	66	48	52	49	56	50	61	48	55	37	1035

The imperfections of this table, particularly with reference to pulmonary diseases, all grouped together, have considerably delayed the use of the information—intended at the outset for the meeting of the Association a year ago. But Dr. Daniel Bascome, the only physician of the islands for about thirty years, was on a visit to England at the time the record was copied, and as his early return, by the way of New York, was at the time expected, it was awaited, with a view to obtaining the needful detail. He arrived, as expected, but, unfortunately, not feeling well enough to give the subject immediate attention, was soon after taken sick and died of pneumonia.

Notwithstanding, the inquiry has been pursued and the record closely scrutinized by an intelligent observer conversant with it. Mr. Joseph Hutchings, editor and proprietor of the only newspaper published in the islands, writes :

"I have lived in Grand Turk thirty-four years. I think it is one of the healthiest places on the face of the earth. There are over 2000 Turk's Islanders in the different ports of San Domingo, within seventy miles, and two-thirds of the adult deaths are from diseases contracted there, whence they come to their relations to die. I knew every one who died in Grand Turk during the ten years, and, in looking through the records, I am satisfied that the number from pulmonary consumption does not exceed three or four yearly."

By reference to the table it will be observed that the number of deaths from pulmonary diseases of all kinds during the ten years was 155. If the larger number given by Mr. Hutchings, 4, annually, among the 553 registered in Turk's Island during the ten years be taken as the approximate proportion from pulmonary consumption in the whole population, the ratio from that disease to that of other diseases of the lungs, will be about the same as the proportion observed in these latitudes—one half ; and the ratio of deaths from pulmonary consumption to the deaths from all causes in Turk's and Caicos Islands, about seven per cent.

Moreover, it is interesting to observe, in this connection, that the proportion of deaths from diseases of the lungs to those of other diseases in the village of Grand Turk is, according to the usual wont of such diseases, considerably larger than in the Caicos—the scattered population.

Of deaths from fevers, on the other hand, the proportion in the scattered population is almost twice as large as that in the village; and Mr. Hutchings remarks, in regard to their prevalence, "Very few originate here, except an occasional case of bilious fever. The Islanders who go to San Domingo contract malaria, which, strange to say, kills the blacks without fail; most of whom are young persons."

Of the large number of accidents recorded, the most prevalent is drowning—15 of the 50 registered.

"Eye diseases" are remarked upon as being especially prevalent.

Of the large number of deaths registered "senile decay," more than one sixth of the total number of deaths, the ages at death range from 65 to 103 years, and average about 74.

Of the deaths registered from infantile diseases, under three years of age, and thirty per cent of them under three weeks, the number is not quite twice as large as that from senile decay. Measles, whooping-cough, and thrush are the alleged chief causes.

"Throat diseases," from which thirteen deaths are registered, include bronchitis, and, in the Caicos, ulcerated throat. There is no record of diphtheria.

For the rest, the table is sufficiently explicit.

On the whole, it may be remarked, the population of these islands is a staid one to an extraordinary degree and exclusive.

The place has but few visitors, and those for short periods; the sickness and death-rates are not swelled by strangers. On the other hand, these people are generally poor. They rarely leave their homes except from necessity—in search of work—and then as before stated, they visit the less healthful place, San Domingo, where they contract fever. Their occupations and regimen are alike unfavorable to strength of constitution and protection against pulmonary consumption. Yet they are exempt to an extraordinary degree, and the exemption appears to be wholly dependent upon the climatic conditions to which they are exposed.—*Medical News.*

THE WARING SYSTEM OF SEWERAGE?

A DISCUSSION OF CERTAIN POINTS IN CONNECTION WITH SEWERAGE AND DRAINAGE IN THE VILLAGE OF NEW BRIGHTON, S. I.

By ARTHUR HOLLICK, Ph.B.

THE first sewers in this village were constructed in 1875; they wereupon the combined system, and apparently served as such excellent examples that none have since been attempted upon similar plans. The first of these was through portions of Central Avenue and Arietta Street, and was petitioned for ostensibly as a sewer to be constructed through these streets "of sufficient capacity to carry off the water which drains into them." As a matter of fact, the real object of this so-called sewer was to divert a brook from its natural course, and this it successfully accomplished. The outlet of the brook was at a point where a slip had been dredged out, and the quantity of silt carried down by the brook was a constant source of trouble. It would hardly do to state all this in public records, hence the petition for a sewer, with which no direct house connection was made until about ten years afterward! The first *bona fide* combined sewer was constructed shortly afterward through Clinton Avenue, and it has amply fulfilled its mission as an educator, even if it has failed to do all that was expected of it as a sewer. This sewer is constructed partly of brick and partly of sixteen-inch pipe, circular in cross-sections throughout, and cost $8767.99, or about $3.90 per lineal foot. The average annual outlay for keeping it in proper condition has been about $100, and constant complaints are made in regard to foul odors emanating from it through street culverts. Compare with this the La Fayette Avenue sewer, constructed of five-inch vitrified pipe, which cost only $2767.99, although a trifle greater in length, which has cost nothing for maintenance, and which is as clean and free from nuisance to-day as when first laid.

Matters seemed to come to a standstill after this experience, until the year 1882, when the subject of small pipe sewers began to be agitated, and from that time forth the village practically committed itself to the separate system, presumably for sanitary reasons only. Interested parties took it up vigorously, and the Davis Avenue and La Fayette Avenue sewers were laid. These gave such universal satisfaction that others were laid, and it is safe to say that only pipe sewers will hereafter be permitted. This is a matter for sincere congratulation, so far as it goes, but unfortunately there is a feeling of distrust in regard to the ultimate intentions of certain parties claiming an interest in the so-called patents of Mr. George E. Waring, Jr., which include almost every detail of the work thus far accomplished in the village. Up to the present time, although several miles of small pipe sewers have been laid, with automatic flush tanks, etc., complete, and necessarily including other details of the patents, yet there is apparently no record on file of any claim for royalty ever having been made, or of any tribute having been paid to any one. Nevertheless, this apprehension is fostered, let us hope inadvertently and with the best intentions, by the persistence with which the attempt is always made to insert the name of Mr. Waring into every petition which is started for a sewer. Latterly, however, the people have become more or less alive to the fact that small pipe sewers may be laid without the necessity of including the name of Mr. Waring, or any other person in the petitions, and there is no doubt that a firm stand would be taken against any pretence of enforcing claims on account of any patent or other alleged rights, just as has been done in other places. In more than one instance parties have refused to sign a petition presented to them unless the name of Mr. Waring was expunged. In other cases, unfortunately, the petitioners allowed their names to be used for sewers to be constructed under the "separate or Waring system," thus giving a quasi-official sanction to it. Under these circumstances, it seems as though a critical and impartial examination of Mr. Waring's patents and the claims covered by them might well be discussed here, especially so far as the sanitary aspects of the subject are concerned.

The first patent granted to Mr. Waring is dated January

18th, 1881, and states that : " The invention consists in providing a system of sewerage for the collection and removal of house waste and foul waters, and their removal—independent of the removal of storm water—through one main pipe to each system ; providing flushing tanks at the ends of the branch-pipes, connecting the house drains with the sewers by a branch as large at their junction as the sewer, and ventilating the system by providing open gratings to admit air to the sewer, *and connecting house drains with the sewer without the use of traps, extending the same above the house*,* so as to insure a continuous circulation of air through all parts of the sewer.

" The invention further consists in laying into the same trench with the sewer pipe, a drain pipe, and in the peculiar and novel devices more fully set forth hereinafter, by which the construction of the system is facilitated, and its continuous and efficient operation secured." This part is certainly plainly stated, and should be readily understood without quoting anything further. The following part, however, referring to drainage, needs to be quoted in full in order to be appreciated : " Drain pipes are usually laid with a ring surrounding the abutting ends of the pipes. This ring serves to hold the pipes in line until the trench is filled in and the soil is settled around the pipe. This joint increases the cost of the drain pipe without adding to its durability or usefulness, and it is desirable to dispense with the same. In figs. 10 and 11 my improved joint is shown. *B B* are two lengths of drain pipe, and *X* is *a strip of stout paper wrapped around the joint*.* This paper is sufficient to retain the joint in place until the drain pipe is securely laid. It is much cheaper than the older sleeve, and as in time it will be dissolved by the moisture, the open joint of the porous pipe becomes available for drainage." The question of the validity of a patent founded upon such " inventions" need not concern us—that is something for the lawyers to decide—but the sanitary aspects of the same are fair subjects for our criticism, and it should be the duty of every one conversant with any facts in connection with the practical working of the system, or the principles involved in it, to make them known, with such bearings as they may have upon the public health. In the first place, the danger from

* The italics are mine.—A. H.

the untrapped house connection was so universally understood and recognized, that protests and criticisms poured in from all directions. Almost every sanitarian of note condemned it, boards of health prohibited it, and all people of intelligence refused to allow their houses to be connected in that way. I take it for granted that this is so well known at the present time that reference to any authority or particular case is not necessary. It is the opinion of several who are competent to express themselves upon the subject, and who are generally accepted as authority in such matters, that more than one case of fatal illness in the village of New Brighton, and one series of cases almost amounting to an epidemic, can be clearly traced to the untrapped house connections along the line of one of the "Waring" sewers. The facts were so conclusive that the Board of Health was forced to recognize their significance, and in consequence, the following resolution was adopted, which may be found in the minutes of the Board for August 23, 1887.

"That all house drainage hereafter connected with the public sewers of the village be provided with a proper running trap, situated at a point convenient of access, and having a hand-hole for cleaning, fitted with a gas-tight cover. An air inlet pipe for the house drain of adequate size is required to be connected just inside the running trap and opening at some point not in the immediate vicinity of a door, window, or cold-air box for a furnace. Where necessary, vent pipes will also be required on the outside of the running traps."

It may seem strange, but it is the fact that considerable opposition was encountered in trying to enforce this resolution in spite of the almost vital necessity for it. There is no doubt, however, that most of this was due to interested parties, who imagined that it was intended as a blow at Mr. Waring and his system, probably not being aware that Mr. Waring had long before been forced to yield to the overwhelming evidence, and secure a modification of his original patent in order to be in line with the sanitary progress of the day. Such is the fact, however, and on June 5th, 1883, a second patent was obtained, which is worthy of the most careful reading from beginning to end. It states that "The improvement hereinafter described has reference to and is predicated upon the

improvement in sewering and draining cities set forth in the Letters Patent, No. 236,740, dated January 18th, 1881, heretofore granted me, and to which reference may be had.

"The object of the present improvement is to simplify the system described in said patent without lessening the efficiency of the system. . . . I have . . . ascertained from experiment that while it is desirable and proper that the house connections with the sewer should extend through the house top without traps between the house and the sewer, *it is not indispensably necessary for the practical and efficient working of my system of sewering that the house connections should extend through the roof of the house, nor that trap connections between the house pipes and the street sewer be omitted.*" * The calm manner in which the unventilated house drain and soil pipe is referred to may strike the sanitarian as being even more reprehensible than the previous attempt to enforce the omission of the house trap. What, then, will be said in excuse of the following words:

"In cases where an open soil pipe is not carried through the roof of the house, and where the house drain is separated from the sewer by an intervening trap, the influence of the volume of water discharged from the flush tanks and flowing through the sewer pipes is so great that a very effective ventilation of the sewer is secured, for the reason that an ordinary house trap affords so little resistance to air-pressure that *in the absence of an open ventilated soil pipe passing through the roof, the water in the traps will yield and permit the passage of air through the traps by the process known as the 'siphonage of traps,' and consequently there will be a considerable amount of air which will be sucked into the house pipes through the bowl and closet traps, where there is a system of small sewers copiously flushed by flush tanks at the heads of the branches, as contemplated by my system.*" *

If these words were not definitely known to be the statement of a fact by an eminent sanitarian of the present day, we might imagine ourselves to be reading an account of house drainage in the Middle Ages. To all appearances it is a matter of the utmost indifference that the traps of the fixtures in the houses are siphoned, their water seals destroyed, and free access of sewer air to the houses permitted. There is not a

* The italics are mine.—A. H.

word of warning or a hint of danger given, and certainly where a person with the popular reputation of the patentee fails to sound a note of alarm, and even speaks as though the arrangement receives his sanction, it is not likely that the average person will look for danger. He would be more likely, in fact, to accept without question everything for which he knew Mr. Waring to be responsible. It therefore becomes the duty of all who are conversant with the facts to point out the dangers and indicate the proper precautions to be taken wherever the small pipe system is in use. Fortunately, most plumbers understand the necessity for a proper ventilation of all soil, waste, and drain pipes, and it is a rare matter to find a house built in any enlightened community, within the past ten years, where this is not, at least in a measure, attended to. The chief danger is to be found where old houses are connected with the public sewers. Local boards of health should adopt and enforce rigid rules whenever such connections are made, and none should be permitted unless the house pipes are ventilated, all fixtures trapped, a main trap provided on the house drain, and a fresh-air inlet connected just inside this trap. Should it be deemed advisable, in order to maintain the seal of the house trap, or to provide a vent for the public sewer, a cast-iron pipe could be run from the outside of the trap to some point where no danger could ensue from the escaping sewer air, preferably above the roof of the house. But, to return to the wording of Mr. Waring's last patent: "While my system comprehends the exclusion of storm water from the sewer pipes, it is to be understood that I mean by the statement that storm water is to be excluded, that the system of pipes is not to be constructed as a whole with reference to taking care of storm water draining from the streets or from the roofs of houses, *and although in individual cases the connection of a rain-water leader with the sewer by a householder may be made, or an occasional instance of the connection of a street culvert with the sewer may occur, the same would not change the character of my system.**

"While my system comprehends the exclusion of storm-water from the sewers, and is not adapted to receive such water from any large proportion of street or roof surface, *it*

* The italics are mine.—A. H.

will not be injured or rendered inoperative by the fact that the authorities of the town may fail to enforce the rule of complete exclusion,* so that, for instance, a householder may surreptitiously connect a roof leader, etc. . . .

"There is also included in this system the combination with the sewer, when it is laid through wet ground, of a porous sub-soil drain, made of drainage tiles with permeable joints, substantially as shown in my said former patent; but the improvement herein exhibited is *the method of protecting the joints against the admission of earth by wrapping them with a woven or felted fabric*.*

"In my former patent the joint is protected by a strip of paper wrapped around the pipe at the joint. A better result may be obtained *by wrapping around the joint a piece of muslin or similar fabric*,* which is much stronger and more durable than paper."

It will naturally be asked, after reading this, whether any attempt at sewering and draining can be made without infringing upon these patents. Apparently, everything which has ever been tried in the past, or is likely to be tried in the future, is included, besides certain contingencies which may occur. They comprehend pipe sewers of all sizes, combined with some method of automatic flushing, omitting or including any particular method of ventilation, admitting or excluding storm water in limited quantity, omitting or including traps upon house connections, and omitting or including open soil and waste pipes. Fortunately, sub-soil drainage may be indulged in by any one who may wish to do so, and no lawsuit need be feared, provided, of course, that the joints of the pipes are not wrapped with paper, muslin, or similar fabric. In view, however, of the experience which some misguided individuals have had with paper and muslin joints, it is pretty safe to say that this part of the patent will never be in danger of infringement.

There are many other details of considerable interest in connection with the subject, and much that is yet to be learned by experiment and experience. According to the wording of the patents, the connection between the sewer and house

* The italics are mine.—A. H.

drain must be a funnel-shaped **Y**, four inches in diameter at the house end, and of the same diameter as the sewer, whatever it may be, at the sewer end of the **Y**. This is stated to be in order "that their flow may be delivered at the bottom of the sewer, and so that they may withdraw the air from its crown." As a matter of fact, sewers which are supposed to be constructed upon the Waring system in the village of New Brighton *are provided with* **T** *branch connections on the top of the sewer.* This arrangement practically raises the level of the sewer by more than the amount of its own diameter, making it sometimes impossible for house drains having a limited fall to connect with it. This has occurred more than once, and in one instance I am credibly informed the result was that an exasperated property owner surreptitiously broke a hole in the side of the sewer-pipe in order that connection could be made with it, the **T** branch on the top being at too high a level. As there is no sanction in any of Mr. Waring's patents for such connections, I was curious to ascertain the reasons for their use, and was kindly furnished with the following answer to my question by the village engineer: "They make a much better line, are easier to lay, are less liable to cause stoppages, do not cause eddies in the flushing current, do not present corners where solids can lodge, making thereby a cleaner line, and afford the most convenient hand-holes for getting at possible obstructions, without cutting the pipe or interfering in any way with the flow of sewage. **Y**'s are never used except when we find it necessary owing to lack of fall—then I cut the pipe and put in a slant myself. I have had occasion to do this twice only."

Were these advantages discovered by the village engineer, or may we shortly expect another patent from Mr. Waring covering this point?

If it were not a very serious matter, it would be almost amusing to read the following ingenuous passage from Mr. Waring's first patent: "With the system of small pipes now described the flushing would be so constant and complete, and the amount of ventilation furnished, as compared with the volume of air to be changed, would be so great, that what is popularly known as 'sewer gas' would never exist in any part of the public drains. Even the gases produced in the traps

and pipes of the house itself would be amply rectified, diluted, and removed by the constant movement of air through the latter." It is probably upon this theory that the " siphonage of traps" is regarded with so much indifference, or it may be necessary, in order to preserve patent rights, that statements must be made which it is never intended shall be incorporated into actual practice. For the sake of all who have been instrumental in pushing the " Waring system" ahead at all hazards, let us hope that this is the explanation of the case, and that Mr. Waring is not responsible for the many blunders which are credited to him, and for which his own words are certainly to blame.

* * * * * * * * *

Since writing the above, several facts of importance have come to my attention which have a direct bearing upon this discussion. Thus, I found upon file in the office of the village clerk a letter from Mr. H. L. Horton, addressed to the Trustees, dated July 10th, 1883, in which he states that the total cost of constructing the sewer, now known as the Horton sewer, from Fort Hill to the Arietta Street sewer, was $3587.99, which sum included " all labor, material, royalties, etc." No mention is made in regard to whom the royalties were paid, or their amount, but as the sewer is constructed of small pipe, with flush tanks, etc., it is to be presumed that Mr. Waring, or some one representing him, received the money. Another letter, dated July 24th, 1883, from Mr. E. J. Thompson, attorney, calls attention to the rights of Mr. C. T. Barrett in all sewers laid under the Waring system in this region, from which it was inferred that Mr. Barrett was Mr. Waring's accredited representative in the village of New Brighton. This fact was generally understood, although nothing of a documentary nature more tangible than the above could be obtained ; for, as long as a few favored individuals secured the contracts for laying sewers, nothing was ever heard of royalties being either claimed or paid. Within the past few weeks, however, a contract was executed between the village and Mr. Dennis Donovan for the construction of a pipe sewer in Jersey Street, and the work of construction was promptly begun. The specifications call for 700 feet of 10-inch pipe, and 3350 feet of 8-inch pipe. Forty 4-inch by 10-inch

and 150 4-inch by 8-inch double T's are required for house connections, and two automatic flush tanks, with Field's improved siphon, are to be attached. Immediately upon the commencement of the work, Mr. Donovan was approached by Mr. Barrett, who endeavored to dissuade him from continuing the work, and threatened to sue him for royalty in the sum of $440, or at the rate of about ten cents per foot of sewer to be laid, in case he completed the work and complied with the provisions of his contract. Naturally, no attention was paid to this demand and threat, so shortly afterward the following letter was received :

BOSTON, June 7, 1889.

Dennis Donovan, Esq.

MY DEAR SIR : I am instructed by the owner of Letters Patent on Waring's sewerage system to inform you that the system of sewers about to be constructed by you in the village of New Brighton, Richmond County, N. Y., is an infringement of said Letters Patent, and that any infringement of these Letters Patent will be prosecuted to the full extent of the law.

Yours very truly,

GEORGE O. G. COALE.

P.S.—Further information can be had at the above address.

It is needless to add that Mr. Donovan is proceeding with his contract, and the only fear experienced by his advisers and others who are disinterestedly conversant with the facts, is that the threats will never be carried any further, and that the issue will never be brought into court, but will follow in the wake of the numerous other abortive attempts to enforce Mr. Waring's absurd claims. Lest the tone of these remarks, and the general treatment of the discussion, might be considered as merely the expression of personal opinion on my part, I would respectfully refer to the treatment which the subject has received, within the past six months, at the hands of parties whose authority will not be questioned, in the columns of the *Engineering and Building Record and Sanitary Engineer.* In particular, I would call attention to a communication from Mr. Andrew Rosewater, of Omaha, Neb., which is published in the issue of May 4th, 1889. Perhaps I cannot do better,

in closing, than to quote the following words from his communication :

"The publication of Mr. Hartford's report on the lamentable condition of the Memphis sewerage, and Colonel Waring's subsequent attempts at explanation of the defective features which, until now, he has extolled as possessing superior merit, added to Colonel Waring's persistent misrepresentation of the sewerage of other cities, and his claims to originality of conception of the separate sewerage system . . . certainly demands attention at the hands of every engineer who takes any interest in sanitary science, and particularly those having such work in charge." [Then follows a critical discussion of the patents, which should be read by all who wish to be well informed on the subject.] After this he uses the following words and asks the question, which I have often asked myself : "In view of this, the great problem of the sanitary engineer of this period, is, WHAT CONSTITUTES THE WARING SYSTEM ?" Perhaps as good an answer as any was the one received by me, not many days since, from the lips of a well-known sanitarian, "THE WHOLE EARTH !"

THE DISPOSAL OF LONDON SEWAGE.—In view of the difficult question of the disposal of London sewage receiving the attention of the London County Council shortly, Sir H. Roscoe, M.P., has issued a statement of the position of affairs. Sir Henry has come to the conclusion that the proposal of the Board of Works for the disposal of the sewage was based on false principles—first as regards the addition of lime and iron in the proportions recommended ; second, as regards the addition of manganate of soda to the effluent after precipitation in the quantities suggested ; third, as regards the formation of underground settling tanks at Barking and Crossness ; fourth, as regards pumping the sludge into tank steamers and sending it out to sea. On this £1,013,786 had been spent from 1884–88 inclusive. Sir H. Roscoe suggests that an engineer of high eminence, and a chemist of like position, should at once be appointed to reconsider the whole question.—*Builders' Reporter and Engineering Times.*

THE DISPOSAL OF SEWAGE IN SMALL TOWNS.

We clip from a late number of the *Builders' Reporter and Engineering Times* the following account of the recently introduced works for the disposal of the sewage of Kingston, Surbiton, and Hampton Wick, England.

After an immense amount of money had been spent in opposing rival schemes, which contemplated the tacking on of Kingston to a number of other towns and parishes, the present plan for the above-named places was agreed upon, the system adopted being that of the Native Guano Company, or the A B C, as it has been more familiarly known. The site, which is a short distance from the station of the London and Southwestern Railway, is of considerable extent, and the works have been carried out in a very substantial manner from the designs of Major Macaulay, the borough engineer. The sewage (which was formerly discharged into the Thames) is now received in a screening chamber at the works, where a grating intercepts the coarse matter and *débris* likely to injure or choke the pumps. Thence it passes to a pump-well under the main building, where it receives the deodorizing and purifying mixture, and is there raised about 12 feet by three of Gwynne's centrifugal pumps, the power employed being equal to the lifting of 1650 gallons per minute. The pumps discharge into a metre chamber, where the sewage is measured and the quantity registered. It then flows along an open channel to the settling tanks, receiving on its way the precipitating agents. There are eight of these tanks, each 85 feet long by 50 feet in width, and with an average working depth of 6 feet. Altogether the tanks hold 1,200,000 gallons. As the treated sewage flows on the solids are deposited, and the effluent passes away in a clear light stream, finding at last an outlook into the Thames through a covered channel. The deposit is pumped into the sludge well, from whence it is first drawn, into four accumulators, by the creation of a vacuum, and is then forced by air pressure into filter presses on the first floor of the main building, from which it is removed in hard cakes.

These are dried in a Borwick's drying cylinder, and ground into powder, which is the "native guano" in its perfected state, and ready to be sold to farmers and gardeners at the price of £3 10s. per ton. The Surbiton sewage is separately received and screened, and is then passed into the Kingston pump-well; and in a short time Hampton Wick will send its sewage over the railway to the works, by means of one of Shone's ejectors. At the present time the sewage treated is that of a population of about 38,000, but with some comparatively inexpensive additions the works will meet the requirements of a population of 50,000 or more. The cost has been £23,000, exclusive of the land. The contractor was Mr. W. Cunliffe, of Dorking. The two main driving engines, which are used alternately, as well as the pump engines, are of Messrs. Willans & Robinson's patent kind, and two powerful mortar mills are used for grinding the chemicals. The cost of the machinery (which is included in the above-named sum) was £8500.

On the occasion of opening the works, Alderman W. East said that the Native Guano Company claimed to be able to produce a valuable manure for agricultural and horticultural purposes, and distinctly denied the allegation that its fertilizing properties were destroyed by the chemicals employed in the process. He had used it for years on farm and garden, and with highly satisfactory results. Its value must be based upon the experience of the agriculturist rather than upon scientific analysis. The Mayor of Kensington referred to the difficulties which had beset the corporation during the last twenty-five years in settling the sewage question, and said that the present system had been tested in every way which would produce a good effluent and a marketable "sludge." The cost to the town was 1½d. in the pound for works and 3d. for the treatment of the sewage.

THE HEREDITY OF TUBERCULOSIS.—Hutinel, of the *Hôpital des Enfants Malades*, has published a communication on the "Heredity of Tuberculosis," of which the conclusions are as follows:

As for the direct transmission of the germ from the parents, we are warranted in affirming that communication by the father is not proved, and is very problematical; transmission by the mother may take place, but it is extremely rare.

Heredity, nevertheless, exists; for if the offspring of phthisical parents are not born tuberculous, they are *tuberculizable;* they may not, it is true, have brought with them the germ from their birth, but they have inherited a culture soil (*terrain*) favorable to its development.

In accordance with these conclusions, which are in harmony with a multitude of clinical observations, Langerhaus, who has long practiced in Madeira, has noted that among the individuals not phthisical that have come to that island for a certain number of years, only those born of tuberculous parents become infected by the numerous phthisical patients resorting to that island every year. Of every ten individuals with phthisical parentage, one died of tuberculosis, while the proportion of those becoming consumptive with no hereditary predisposition has been as one to sixty-eight.

INDIAN TREATMENT OF CONSUMPTION.—As an illustration of the benefit invalids obtain from the *climate* of the Upper Columbia, it is related that the wife of an army officer, then stationed at Fort Okanagau, came from the east suffering with severe lung disease, hoping that the change of climate would restore her health. Instead of improving, she became worse from day to day. An old Indian suggested that he could cure her. As a last resort he was allowed to try his treatment, which consisted of killing a dog and immediately cutting open the abdomen and placing the bare feet of the invalid therein, and letting them remain until the intestines were nearly cool. Thirty-five dogs were thus sacrificed to suffering womanity, and she recovered.

We can readily believe that this method may have relieved the engorged lungs, and the pure bracing air of that region restored her to health. Such treatment ought to become universal in our American cities and villages that are so infested with worthless and dangerous curs.—*C. G. Higbee, M.D., New York Medical Times.*

SIMPLIFIED WATER ANALYSIS.

DR. THEODORE DEECKE, special pathologist at the New York State Lunatic Asylum at Utica, has kindly sent us the following corrected copy of a published interview with him in a recent issue of the Utica *Herald*. He said :

"It is a fact that the various processes by which, for hygienic purposes, the organic matter in drinking water may be estimated are still imperfect, and that not one of those generally employed can be considered to justify the claim of absolute value for its results. If in a respective case every one of the processes is resorted to, the analyst probably may come to definite conclusions whether the water is to be condemned or not, whether or not the organic substances discovered therein are harmless or hurtful to the human system. Where this is not done, the conclusions are of doubtful value, and the opinion is formed more from the general condition and character of the water than from the special reactions and behavior of its organic constituents. For this reason, a new and very simple process for determining the nature of organic impurities in water may be perhaps not unwelcome. The only really dangerous contamination of waters of wells and reservoirs—which in this connection come more especially into consideration than the running waters—when they are not otherwise exposed to specific pollution from manufacturing establishments, is their pollution with privy and sewage material. In both there is present such decomposing animal and vegetable refuse as, on the one hand, constitutes the very nidus for the growth and thriving of germs of infectious diseases and, on the other, is liable to produce organic poisonous compounds in the form of organic alkaloids or acids belonging to the aromatic and fatty series, or both combined.

"The presence of the former, of germs of infectious and infective diseases, can be ascertained by the microscope only, either by examining the deposit directly formed in the water, or by examining microbic cultures made on the well-known organic media, with the deposit retained by the filtration of the water through cotton filters.

"The organic alkaloids, when present even in considerable quantity, cannot be detected either by odor or taste or in visible state as crystalline or amorphous matter, or directly by chemical reactions. The aromatic and fatty compounds and acids may be perceived by smell or taste, but are generally present in such small quantity only that they escape detection without resorting to other means.

"I have used for these latter purposes, in my analyses of well and other waters in this city and from other places for a number of years, the following process, which is the same in substance with the one employed for the detection of organic poisons in organic material and tissues, and which, indeed, gives the most satisfactory results :

"Two to four quarts of the water to be tested generally suffice. One half is rendered alkaline by adding a small quantity of soda or potassa, the other acidulated by a little sulphuric acid. Both samples, well corked, are digested for an hour or two at a temperature not exceeding one hundred to one hundred and ten degrees Fahrenheit. After cooling, the fluids are shaken thoroughly and repeatedly with a proper amount of pure ether. After complete separation of the liquid from the ether, which then has dissolved from the water almost all of the liberated alkaloids, volatile, aromatic or fatty compounds, if such had been present in the sample, the ethereal solution is removed from its surface. It is filtered into a small flask, and the ether carefully distilled off at a temperature not quite reaching its boiling point. The residue is preserved for further examination. One half of the ethereal solution may also be distilled mixed, or another mixed ethereal extract be prepared from one or two quarts of the water if it is deemed necessary.

"The residue in the flask is left exposed to the air until the last traces of ether have evaporated. It is then dried over calcium chloride, when it will be found to be either of an essential oily nature or transformed into a crystalline or amorphous mass, or to consist of a mixture of the three.

"Now in any case where there existed a privy or sewage contamination of the water, this will be rendered at once perceptible in the residue by its odor, which, in the concentrated form of volatile and aromatic compounds, is very characteristic of its source and cannot be mistaken.

"The residue in most cases is of a mixed nature, and by proper manipulations one may succeed in separating the crystallizable and amorphous substances from the oily or volatile ones for further microscopical and chemical investigation, and occasionally may get one or the other characteristic reaction. If, however, a few quarts of water only have been handled, the quantity of the residue is too small in general as to permit of the determination of the chemical nature of the alkaloids, acids, or volatile compounds present. This must be left to further investigations by handling large quantities of such contaminated waters, which, on account of my at present limited laboratory facilities, I have not been enabled to carry out.

"Yet successful experiments have been made occasionally during the last seven years, for the purpose of examining the action of these substances upon the animal system by injecting watery or alcoholic solutions of the same into the blood of warm-blooded animals, as mice, birds, and rabbits. It was found that some of these compounds act as most virulent poisons. A few cases may be mentioned here. In one case the ethereal extract was from a well-water in the eastern part of this city, near the streets not provided with sewers. The well was located on premises occupied by a family of nine persons, of whom eight at the time had been suffering for weeks from a severe attack of malarial-fever which, in two of the cases, had assumed a typhoid character. A few drops of a watery solution of the mixed extract injected into a rabbit weighing two pounds and eleven ounces, killed the animal within half an hour. In another case, where a rabbit of about the same weight was killed within two hours and a mouse in eleven minutes, the extract was from the water of a well on a farm situated not far from a barn in which cows and horses were kept, and a heap of manure. On the farm at the time was a local epidemic of typhoid-fever, with two deaths—a fact which led to the examination of the water. The ethereal extract in this case contained, besides crystallizable alkaloids, fatty acids, and volatile aromatic compounds, a remarkable quantity of benzoic acid.

"In a third case the extract was from the water of an at times stagnant pool on a meadow once used as a pasture for cows, but which had been suspected to contain some poison-

ous weed, for at several times heads of cattle pasturing on it had died suddenly and mysteriously. A few drops of the mixed watery solution injected into a rabbit killed it within twenty minutes. The meadow in question is located about a quarter of a mile beyond the city limits, surrounded by farms, but has been deserted for the last five or six years. It is perhaps worth mentioning that from the same water, at the time when the last death on the pasture occurred, I received pure cultures of the anthrax bacillus.

"For the practical hygienic examination of waters the above method is fully reliable, and seems to be superior, as regards simplicity and delicacy, to any of the other processes. It permits of detecting directly even the minutest admixture of sewage or privy material without fail. I nevertheless always determine the organic matter in toto by ignition, which, besides, on account of the peculiarities of the odor of the smoke exhaled at slow ignition, may lead to some good judgment as regards the nature and quality too of the organic matter present. The permanganate and the albuminoid processes I consider as very vague and uncertain in their results and in the conclusions drawn from them.

"The products of the ethereal extract after the methods described above are worthy of being investigated more scientifically. Some of them apparently will be found to belong to the class of the so-called ptomaines or cadaver alkaloids, the chemical nature and physiological action of which recently have become the subject of closer study."

A GLASS OF WATER REMEMBERED.—When King Agrippa was in a private station he was accused by one of his servants of speaking ill of Tiberius, and was condemned by the Emperor to be exposed in chains before the palace gate. The weather being hot he was thirsty and called to Caligula's servant, Thaumastus, who was passing with a pitcher of water, to give him some drink, assuring him if he got out of his captivity he would pay him well for so doing. Tiberius dying Caligula succeeded him and set Agrippa at liberty, making him King of Judea, in which situation he remembered the glass of water, sent for Thaumastus and made him controller of his household.

THE MEDALS, JETONS, AND TOKENS ILLUSTRATIVE OF SANITATION.

By Dr. HORATIO R. STORER, Newport, R. I., Member of American Public Health Association, etc.

X. *Epidemics.* Continued from Volume XXII., page 535.*

[I HAVE recently received from Mr. A. de Witte, of Brussels, impressions of another as yet unpublished medal of St. Charles Borromeo, interesting in relation to the epidemic of the plague at Milan in 1576. It will constitute No. 45 of my series of these medals (*American Journal of Numismatics*, July and October, 1888, pp. 10, 35).

During recent studies of ancient Greek medals, it has occurred to me that certain coins of Metapontum, a Grecian colony in Southern Italy, many centuries before Christ, present the record of ancient famines. If this be true, the medals in question are doubtless the earliest of the famine pieces. In Section IX. of the present paper, I gave instances (THE SANITARIAN, August, 1888, pp. 159, 160, Nos. 685–91) of a subdivision of these medals, commemorating European invasions by the Eastern locust (*Locusta migratoria*, Linn.). The Metapontum coins in question are known to numismatists by the device of an ear of barley. Upon some of them there is, in addition, represented a locust, and while in some instances the ear is full, in others it is completely stripped. There are many representations of this in authors. I instance the following from my own library :

Magnan, Miscellanea numismatica, Romae, 1774, 4°, pl. 26, fig. 3 ; F. Neumann, Populorum et regum numi veteres inediti, Vindobonae, 1779, 4°, pl. 8, fig. ; L. Sambon, Recherches sur les monnaies de la presqu'ile Italique, Naples, 1870, 4°, pp. 264, 265, 269, pl. XIX., figs. 3, 7, 9, 11, 12.

* The previous portions of this paper will be found in THE SANITARIAN for May, July, August, October, 1887 ; February, April, July, August, November, 1888 ; February, March, April, June, 1889.

The present suggestion had not occurred to Pfeiffer and Ruland, and I have nowhere found it made. Classical scholars, however, are becoming more and more convinced that many of the devices upon ancient coins which have been thought merely mythological or allegorical are in reality the direct statements of actual events. In THE SANITARIAN for November, 1888, I ventured to point out a probable instance of this, though at variance with what has been the opinion of so high an authority as Mr. Warwick Wroth, of the British Museum.

There is another query that I would submit about these Magna-Grecian coins of Metapontum. Several that have the barley ear have also upon them, in connection with it, another insect than the locust. It is clearly dipteric. Possibly it may be the wheat-fly of Europe (*Cecidomyia tritici*, Kirby), and therefore of the famine series. It more closely resembles the common house-fly (*Musca domestica*, Linn.), and then would doubtless commemorate a plague like that of Egypt. This would be a wholly new addition to the medals of epidemics. The insect in question is represented by Magnan, *loc. cit.*, pl. 25, fig. 2, pl. 28, fig. 5, pl. 29, fig. 4; Sambon, *loc. cit.*, pp. 265, 266, pl. XX., fig. 19.

The many directions in which the study of numismatics opens up questions not only of medicine and surgery and their practitioners, but of natural history, comparative anatomy, and even animal and vegetable physiology as well, render it worthy the earnest attention of physicians.]

VI. TYPHUS, ETC.

A. THE UNITED STATES.

Dr. N. S. Davis, of Chicago. "Report on the Etiological Relations of Epidemic Erysipelas, Spotted Fever, and Diphtheria." *Transactions American Medical Association*, XVII., pp. 379–389. Dr. Davis has already been mentioned under Section VIII., Diet, and subsequently.

Dr. Nathaniel Garland Keirle, of Baltimore.

1084. Obverse. Within a narrow band of leaf work: Trustees of Baltimore City Almshouse To Dr Nathaniel G. Keirle.

Reverse. Within a similar band: For Extra Duty And Faithful Services Rendered During The Prevalence Of Typhus Fever In The Institution. 1866. Gold. 18.

Only two of these medals were struck; the one above described and the following:

Dr. Hugh A. Maughlin, of Baltimore.

This medal is from the same dies with the last. For information concerning them both, I am indebted to Dr. George H. Rohé, of Baltimore. They were both unknown to P. and R., and appear till now unpublished.

B. Great Britain.

Dr. William Alexander (–1783). "An Experimental Inquiry Concerning the Causes, (etc. of) Putrid Diseases." London, 1771, 8°.

1085. Obverse. Bust. Beneath: Mossop. Inscription: William Alexander.

Reverse plain. Bronze. Duisburg, p. 224, dxcvii. In Imperial Museum at Berlin. Unknown to Rudolphi and Kluyskens.

Dr. Sir James Young Simpson, of Edinburgh (1811–67). "On the Analogy between Puerperal and Surgical Fever." *Edinburgh Monthly Journal of Medical Science*, November, 1850, p. 414: Obstetric Memoirs and Contributions, edited by W. O. Priestley and H. R. Storer; Scotch edition, 1855, II., p. 1; American edition, 1856, II., p. 17.

"On the Communicability and Propagation of Puerperal Fever." *Edinburgh Monthly Journal of Medical Science*, July, 1851, p. 72: Obstetric Memoirs and Contributions; Scotch edition, II., p. 20; American edition, II., p. 33.

"Hospitalism" (Anaesthesia, Hosp., etc.), edited by Sir W. G. Simpson; Scotch edition, 1871, p. 289; American edition, 1872, p. 289.

"On Surgical Fever." (Clinical Lectures on the Diseases of Women.) Edited by A. R. Simpson. New York, 1872, p. 296.

In speaking of Professor Simpson in my paper upon the medals, etc., illustrative of midwifery and the diseases of women, I was able merely to mention that he had received

from the Academy of Sciences of the Institute of France the great Montyon medal of gold, in recognition of his being one of the most eminent of physicians, sanitarians, and philanthropists. Since then I have received from his son, Sir Walter G. Simpson, a drawing of the medal, and the following description :

1086. Obverse. Helmeted head of Pallas Athene, to right. Inscription : Institut Imperial de France | Constit. Art. LXXXVIII.

Reverse. Within a laurel wreath : Academie Des Sciences | — | Fondation Montyon | —Medecine Et Chirurgie | — | Prix | James Y. Simpson | — | 1856. Name engraved and enamelled in black. Gold. 35. 55 mm.

Dr. Simpson might have been previously referred to under Small-pox and Vaccination, as he wrote upon both these subjects, but his contributions to Hospitalism have been so preeminently important that his place is rather here. He will also be referred to under Leprosy.

C. Belgium.

Dr. Joseph Guislain, of Ghent (1797–1860). Address upon Typhus before Belgian Royal Academy of Medicine, 1851.

1087. Obverse. The staff of Æsculapius and a branch of laurel, forming the cross of St. Andrew. Inscription : École De Médecine De Gand 1818.

Reverse. Inscription : Classe D'Anatomie Et De Physiologie—Premier Prix Remporté Par Jos. Guislain. Bronze, enamelled. 45 mm.

Kluyskens, i., p. 399, no. 3 ; H. R. Storer, The Medals of Guislain, *Medico-Legal Journal*, December, 1887, p. 284, No. 1.

1088. As preceding, save Classe De Pathologie Interne.

Kluyskens, i., p. 399, No. 4 ; Storer, *loc. cit.*, p. 284, No. 2.

1089. As preceding, save Classe De Chirugie (*sic*).

Kluyskens, i., p. 399, No. 5 ; Storer, *loc. cit.*, p. 284, No. 3.

1090. Obverse as preceding, save 1817.

Reverse. Inscription : IV Prix De Chimie Et Botan Décerné A J. Guislain.

Kluyskens, i., p. 399, No. 6 ; Storer, *loc. cit.*, p. 284, No. 4.

1091. Obverse as last.

Reverse. Inscription : IV Prix Des Accouchemens, etc., as above.

Kluyskens, i., p. 399, No. 7 ; Storer, *loc. cit.*, p. 284, No. 5.

The medals thus far were all engraved by Armand De Bast. The present had escaped my notice when preparing my paper upon the medals, etc., illustrative of midwifery and the diseases of women, though I enumerated others of similar character that had been conferred by the city and University of Ghent.

1092. Obverse. Minerva crowning a youth, before an altar. To left, Simon G(raveur). Du Roi. Legend : Honos Alit Artes. Exergue : Univ(ersitas). Gandav(ensis).

Reverse. J. Guislain In Certam. Literar. Eruditioris Juvant. Belgicae Victori Doctrinae Praemium 1819 (Engraved). Gold. 35 mm.

Kluyskens, i., p. 398, No. 1 ; Storer, *loc. cit.*, p. 285, No. 6.

1093. Obverse. Bust of the King of Belgium, to right. Beneath, Braemt Fecit. Inscription : Guillaume Premier Roi Des Pays—Bas.

Reverse. Entwined with laurel branches, inscription : Societé Royale Des Beaux—Arts A Bruxelles. Upon edge, Accessit D'Architecture. Joseph Guislain De Gand. 1874. Bronze, silvered. 50 mm.

Kluyskens, i., p. 399, No. 2 ; Storer, *loc cit.*, p. 285, No. 7.

1094. Obverse. Bust, facing, in professor's robe, with the cross of the Order of Leopold.

Reverse. Inscription : Joseph Guislain | Né A | Gand | Le II Février | MDCCXCVII. Gold. 40 mm. The die cut from nature by Ch. Onghena.

Kluyskens, i., p. 399, No. 8, fig. ; Storer, *loc. cit.*, p. 285, No. 8.

1095. Obverse as preceding.

Reverse also, save with the addition : Y Mourut Le I Avril 1860. Gold. 40 mm.

Kluyskens, Num. Méd. Belge, p. 27 ; Storer, *loc. cit.*, p. 286, No. 9.

The above were all unknown to Duisburg and Rüppell, though they were published subsequently to Kluyskens and to Guislain's death.

D. Italy.

Dr. Giovanni Rasori, of Milan (1766–1837). Sanitary Inspector-General of the Cisalpine Republic. "Histoire de la Fièvre pétéchiale de Gênes." 1800.

1096. Obverse. Bust, to right. Beneath, E. Galli F. Inscription: Giovanni Rasori Nato A Parma 1766. Morto A Milano 1837.

Reverse. The staff of Æsculapius, wreathed with oak leaves. Inscription: Al Riformatore Della Medicina Gli Ammiratori. Bronze. Duisburg, p. 37, civ., No. 1. Unknown to Kluyskens. In the Fisher Collection.

1097. Obverse. Head, to right. Beneath, Nesti. Inscription, below: Giovanni—Rasori.

Reverse. Infranse | L'Idolo Di' Coo | Al Culto | Del Verulamio | Addusse Igea | — | Moriva In Milano | MDCCCXXXVII. Bronze. 25 mm.

In Kluyskens's description the first word of the reverse is divided. Duisburg has Morive. He, as also Kluyskens in his description, gives the date in Roman numerals. Kluyskens, ii., p. 342, fig.; Duisburg, p. 37, civ., no. 2.

VII. Typhoid.

A. The United States.

Dr. David Hosack, of New York. "Observations on the Peripneumonia Typhoides, now Prevailing in Several Districts of the United States." New York, 1813, 8°. "Remarks on the Treatment of the Typhoid State of Fever." 1815, 8°.

Already mentioned under Section I., and in the present section, under Yellow Fever.

B. Belgium.

Dr. J. F. Kluyskens, of Ghent. "Memoire sur la fièvre inflammatoire typhöide, qui règne dans la province de la Flandre Orientale." Gand, 1817, 8°.

" Berigt betrekkelijk de febris inflammatoria typhoides welke in de provincie Oostvlaenderen heerscht." Amsterdam, 1818, 8°. Described previously in the present Section.

C. Germany.

Dr. R. Virchow, of Berlin. Sent to Silesia in 1848 by the Prussian Government to investigate a typhoid epidemic.

Already mentioned in Section IX., Famine, and will be again under Syphilis and Leprosy in the present Section, and in XI., Military and Naval Hygiene. His medal has recently been added to the Lee Collection.

There are the following medals also, of interest in this connection.

A. Canada.

1098. Obverse. Portrait bust, to left. Beneath, S. S. Wyon Sc. Inscription : Albert Edward Prince of Wales.

Reverse. Three Welsh plumes within a coronet, between sprigs of roses (to left) and shamrocks and thistles (to right). Motto, upon a band perforated by the central feather : Ich Dien Beneath, J. S. & A. B. Wyon. Inscription : +Recovery·Of·The·Prince·Of·Wales·+ | Canadian-Thanksgiving. 15.Apr:1872. Silver, bronze. 36. 58 mm.

Leroux in his description has a comma after Edward, and on the reverse after Wyon and Wales, and has Sc. after the former. In his figure he omits the engraver's name upon the obverse, and on the reverse the Of.

McLachlan, *American Journal of Numismatics*, January, 1884, p. 59, cccclxxxii. ; *ibid.*, Montreal, 1886, p. 107 ; Leroux, p. 269, No. 1660, fig.

To commemorate the recovery of the Prince of Wales from typhoid in 1872. The reverse was specially prepared for the Canadian day of Thanksgiving, upon the recommendation of Mr. Alfred Sandham, of Montreal. Unknown to P. and R.

B. England.

1099. Obverse as the last described.

Reverse the same, but with the inscription : National

Thanksgiving For The Recovery | Of The Prince. Unknown to P. and R.

VIII. Remittent and Intermittent Fever.

A. The United States.

Dr. B. Rush, of Philadelphia. "An Account of the Bilious Remitting Fever as it Appeared in Philadelphia in the Summer and Autumn of 1780."

"An Account of the Efficacy of Blisters and Bleeding in the Cure of Obstinate Intermitting Fevers."

Already mentioned under Yellow Fever, in the present Section.

B. England.

Dr. Thomas Sydenham, of London. "Concerning Peruvian Bark and the Intermitting Fever." A Letter to Dr. Brady.

Already referred to under General Epidemics, The Plague, and Small-pox, and will be again under Syphilis.

C. France.

Dr. M. F. M. Audouard. "Recherches sur la contagion des fièvres intermittentes." Paris, 1818, 8°. This medal has already been described in the present Section, under Yellow Fever.

D. Germany.

Dr. S. Von Madai, of Halle. Treatise on Periodic Fever.

Already described in the present Section, under The Plague.

E. Sweden.

Carl Linnaeus (1707–78). "Hypothesis nova de febrium intermittentium causa." Harderovici, 1735.

1100–25. Obverse. Bust, to right. Beneath, Liunberger. Inscription : Carolus Linnaeus Arch. Reg. Equ. Auratus.

Reverse. Nature in mourning, surrounded by different animals. At her feet, the plant *Linnæa borealis*. Inscription : Deam Luctus Angit Amissi. Exergue : Post Obitum Upsaliae D. 10 Jan. 1778. Rege Jubente. Silver. 52 mm.

Eigenhandige Anteckningar (Biography) af Carl Linnaeus, etc., Stockholm, 1823, 4°, pl. iii., No. 3; Rudolphi, 1829, p. 95, No. 401; Kluyskens, ii., p. 160, no. 4; *ibid.*, Numismatique Linnéenne, p. 4, No. 4; Duisburg, p. 203, dxxxvii., No. 4.

Linnæus has been so universally known as a botanist that few are aware of the fact that he was also Court Physician. There are at least twenty-five other medals of him besides the mortuary one now described. I do not give them here, since they have already been presented collectively by Dr. H. Kluyskens, of Ghent (*Revue de la numismatique belge*, Series 5, Tom. VI.).

F. Italy.

Dr. Giuseppe Lanzoni, of Ferrara (1663–1730). "Dei febbre quartane." Ferrara, 1691, 8°.

1126. Obverse. Bust, to right. Inscription: Josephus Lanzonus.

Reverse. Hygeia, upon a tripod. 85 mm.

Gaetani, ii., p. 279, pl. 167, No. 2; Rudolphi, 1829, p. 89, No. 374; Kluyskens, ii., p. 123; Duisburg, p. 24, lxiii., No. 1.

1127. Obverse. Bust facing. Inscription: Josephus Lanzonus.

Reverse. A seated figure, reading a book. Near him the staff of Æsculapius, flowers, the head of a sphinx, the mouth of which is closed by a finger, a lyre, and pipes of reed. Legend: Sanat, Docet, Delectat. 85 mm.

Gaetani, ii., p. 279, pl. 167, No. 3; Rudolphi, 1829, p. 89, No. 375; Kluyskens, ii., p. 123; Duisburg, p. 24, lxiii., No. 2.

1128. Obverse. Head, to left. Inscription: D. Josephus Lanzonus.

Reverse plain.

C. Mayr, Monete e Med. Ferrarie, p. 114; Duisburg, p. 24, lxiii., No. 3.

This was unknown to Rudolphi and Kluyskens. According to MS. notes of Professor B. Friedländer, in my possession, it is in the Public Museum at Ferrara.

IX. Malignant Dysentery.

A. England.

Dr. E. A. Parkes, of Netley. "Remarks on the Dysentery, etc., of India." London, 1846, 8°. Already mentioned under Section I.

B. Belgium.

Dr. P. J. Van Baveghem. "Verhandeling over de koortsen," etc. (Treatise upon Epidemic Dysentery.) Dendermonde, 1788–90. Already described in the present Section.

There is another Belgian medal, of interest in this connection. Under The Plague, in the present Section, No. 748, I included a jeton of Charles, Duke of Lorraine. In this I followed Pfeiffer and Ruland. A history of the piece, and of the epidemic itself, has since been published by G. Cumont in the *Revue belge de numismatique*, and it is more than probable that the disease was malignant malarial dysentery. As in the group referred to the jeton was merely numbered, I now give its description. It was issued as a "jeton d'etrenne," or New Year's memorial.

Obverse. Bust in cuirass, to right. Inscription : Car·Alex· Loth·—Dvx·Belg·Praef. Beneath : T. V(an)·B(erkel)·

Reverse. Grassante | Per Provincias | Perniciali Morbo | Salvs Popvlorvm | Procvrata | Providentia Principis | M·DCC· LXXIX· Silver, lead. Octagonal. In the Fisher Collection. P. and R., p. 124, No. 369 ; *Revue belge de numismatique*, April, 1889, p. 289, fig.

C. Germany.

Dr. Andreas Elias Von Büchner, of Halle (1701–69). (With J. T. Laurich) "De Singulari quadam Indorum Orientalium dysenteria." Halle, 1752, 4°.

1129. Obverse. Bust. Inscription : D. Andre. El. Buechner. C. M. Cons. Et Archiat. Acad. Imp. Praes. Chym. Prof. P. Et E. Me.

Reverse. A man sleeping beneath a beech-tree. Legend : Omnibus Refrigerium. Exergue : De Felici Nominali Gratulatur D. 30 Nov. 1742. J. H. Werner. Erfurt. 35 mm. Rudolphi and Kluyskens omit dot after Buechner. The latter has Praeses.

Gaetani, ii., p. 346, pl. 186, No. 2; Rudolphi, p. 27, No. 105; Kluyskens, i., p. 160; Duisburg, p. 127, cccxxxix.

X. Scarlet Fever.

A. The United States.

Dr. N. S. Davis, of Chicago. "Essay on Scarlet Fever." *The Annalist*, ii., pp. 11–26. Already described.

Dr. Benjamin Rush, of Philadelphia. "An Account of the Scarlatina Anginosa as it Appeared in Philadelphia in the Years 1783 and 1784." Already mentioned.

B. Great Britain.

Dr. Sir James Y. Simpson, of Edinburgh. "The Prophylaxis, etc., of Scarlatina, Measles, and other Diseases." *Edinburgh Monthly Journal of Medical Science*, April, 1853, p. 363; Obstetric Memoirs and Contributions, Scotch edition, ii., p. 481; American edition, ii., p. 436.

His medal has been described in the present Section, under Typhus.

C. Germany.

Samuel Christian Friedrich Hahnemann (1755–1843). "Heilung und Verhütung des Scharlach-Fiebers." 1801, 12°.

1130. Obverse. Bust. Beneath, incised, D. S. Hahnemann.

Reverse blank. Lead. Duisburg, p. 162, ccccxxxv., No. 1. Unknown to Rudolphi and Kluyskens.

•1131. Obverse. Head, to right. Upon neck, Krueger F. Inscription: Samuel Hahnemann Natus Misenae D. X. Aprilis MDCCLV. | Doctor Creat. Erlangae—D. X. Augusti MDCCLXXIX.

Reverse. In circular field: Similia | Similibus. Inscription: Medicinae Homoeopathicae Auctori Discipuli Et Amici D. X. Augusti MDCCCXXIX. Silver, bronze. 25. 40 mm.

Duisburg gives the dates, both of months and years, in Roman numerals, and omits dots after the former. Kluyskens omits the dots after the former, and gives the years in Roman

numerals. Ampach, 9588; Kluyskens, ii., p. 8; Duisburg, p. 162, ccccxxxv., No. 2. In both the Lee Collection and my own.

1132. Obverse. Bust, in bold relief. To right, beneath, Emile Rogat 1836. Inscription: Samuel Hahnemann.

Reverse. A circle formed by a serpent swallowing its own tail. Within, Similia Similibus Curantur. Inscription: Né A Meissen Le 10 Avril 1755. Venu En France Le 25 Juin 1835. A Leur Maitre Les Homoeopathistes Français. Bronze. 32. In the catalogue of the Wood Medallic Collection, No. 2329, there is given Curentur.

Kluyskens, ii., p. 8; Duisburg, p. 162, ccccxxxv., No. 3..

This is in the Lee and Fisher Collections and my own.

1133. Obverse. Inscription: A Hahnemann.

Reverse. Inscription, in continuation of that on obverse: L'Humanité Reconnaissante. Beneath, A, Garnier. Gilt, bronze. 33 mm.

Kluyskens, ii., p. 9; Duisburg, Suppl. I., 1863, preface.

1134. Obverse. Head, to left.

Reverse. Shield with monogram. English and Latin inscriptions. 1842. Bronze. 26. Wood Catalogue, February 25th–29th, 1884, No. 2340.

Struck in England. Unknown to Kluyskens, Duisburg, and Rüppell. I have not yet obtained its full description.

1135. Obverse. Bust, to left. Inscription: Samuel Hahnemann.

Reverse blank. Bronze, white metal. 28. Wood Catalogue, February 25th–29th, 1884, Nos. 2341–42–43.

This appears to be the award medal of the Hahnemann Medical College, Philadelphia, and was unknown to Kluyskens, Duisburg, and Rüppell. It is in my collection. There is, besides, a large portrait bas-relief, six inches in diameter, taken from life by David.

XI. Measles.

A. The United States.

Dr. B. Rush, of Philadelphia. "An Account of the Measles as they Appeared in Philadelphia in the Spring of 1789."

B. Great Britain.

Dr. Richard Mead, of London. "A Treatise on the Small-pox and Measles." This was published in both English and German, and has been already referred to.

Dr. Sir James Y. Simpson, of Edinburgh. "The Prophylaxis (etc., etc.) of Measles and other Diseases." This was given in the present Section, under Scarlet Fever.

XII. Diphtheria and Influenza.

A. The United States.

Dr. H. I. Bowditch, of Boston. "Studies of an Epidemic of Diphtheria which Prevailed at Ferrisburg, Vt., During the Summer of 1877." *Transactions American Medical Association*, XXII., 1878, p. 585. Philadelphia, 1878, 8°.

Dr. Bowditch has been spoken of in Sections I., V., VIII., and in another connection in the present, and will be again mentioned in Sections XI. and XII.

Dr. N. S. Davis, of Chicago. "Report on the Etiological Relations of Epidemic Erysipelas, etc., and Diphtheria."

Ibid., XVII., pp. 379–89. Already repeatedly referred to.

Dr. B. Rush, of Philadelphia. "An Account of the Influenza as it Appeared in Philadelphia in the Years 1790 and 1791." Already referred to.

B. England.

Dr. John Fothergill (1712–80). "An Account of the Sore Throat (of 1746) Attended with Ulcers, etc." London, 1748, 8°.

"A Sketch of the Late Epidemick Disease as it Appeared in London." 1775, 4°.

1136. Obverse. Bust, to right. Beneath, L. P(ingo). F. Inscription: Johannes Fothergill Medicus Egregius | Amicis Carus Omnium Amicus.

Reverse. Within a laurel wreath: Medicinae Et Scientiae Naturalis Incremento. Inscription: Don. Soc. Med. Lond. An. Salut. 1773. Instit. Silver, lead. 42 mm.

Rudolphi, 1829, p. 55, No. 227; Kluyskens, i., p. 315; Duisburg, p. 224, dxciv.

Kluyskens has the name Fotergill. This author, and Duisburg, copied from Rudolphi, who knew the medal only in lead. Friedländer, from MS. notes of his in my possession, had it in silver, with a marginal inscription engraved, probably indicating the prize medallist of the Medical Society of London for the year in question.

C. France.

Dr. Louis Poirier, Physician to Louis XV., and Dean of the University of Paris, 1706–7. "Observations upon La Grippe Epidémique of 1708."

There is possibly a jeton of Poirier in existence, but if so the specimen is perhaps unique. Kluyskens (ii., p. 317) states that such is the case, upon the authority of the *Magasin Pittoresque* (1858, p. 87), and that it is in the cabinet of the National Library at Paris, but he is unable to furnish any description. Rudolphi, Rüppell and Neumann had, however, never heard of it. Duisburg (p. 81) merely mentions the assertion of Kluyskens, without further comment. It does not exist in the quite complete Chereau collection of the decanal jetons, which I now own, and there is no intimation there given of its existence elsewhere.

XIII. Pneumonia.

A. The United States.

Dr. Valentine Mott, of New York. "On the Malignant Pneumonia which Prevailed at Newton, Long Island, more than Fifty Years Since."

1137. Obverse. Bust, to right. Under shoulder, G. H. L(ovett). Inscription: Valentine Mott. Founded 1856.

Reverse. Laurel wreath. Inscription: University of New York. Medical Department. Awarded to (here space for name of recipient). G. H. Lovett. 22. 34 mm.

Unknown to Kluyskens, Duisburg, and Rüppell. This is in the Lee and Fisher Collections, and my own.

1138. Obverse. Within a wreath: Chirurgo Peritissimo Valentino Mott Auditores Sui Prid. Id. Fev. MDCCCXXIII.

Reverse. A woman upon operating-table, at whom a skeleton amid clouds aims a dart, which is warded off by Hygeia. Legend: Secat Salubriter. 30. Unknown to Kluyskens, Duisburg, and Rüppell. In the Lee Collection.

The will of Dr. Mott made provision for the following medals as awards from the Medical Department of the University of the City of New York. 1. Gold, for best dried anatomical or anatomo-surgical preparation. 2. Silver, for second best. Bronze, for best report of cases and remarks of the professor of either of the surgical clinics.

XIV. Phthisis.

A. The United States.

Dr. H. I. Bowditch, of Boston. "Louis on Phthisis," Boston, 1836; "The Young Stethoscopist," Boston, 1846, N. Y., 1848; "Is Consumption ever Contagious?" etc. Boston, 1864, 8°.

This last paper was also referred to under the first subdivision of the present Section.

Dr. B. Rush, of Philadephia. "Thoughts," and "Observations" "on the Cause and Cure of Pulmonary Consumption." Already referred to.

The following medal also belongs here.

A. England.

a. Brompton.

1139. Obverse. Heads of Victoria and Prince Albert, to left. Inscription: His Royal Highness The Prince Albert Laid The Foundation Stone On The 11th Of June, 1844.+

Reverse. Front view of the hospital. Beneath, to left, J. Davis. To right, Birm^{m}. Exergue: The New Hospital For | Consumption And Diseases | Of The Chest. Brompton. | —.— | Patron The Queen. White metal. 35. In my collection.

(*To be continued.*)

ABSTRACT OF THE PROCEEDINGS OF THE AMERICAN CLIMATOLOGICAL ASSOCIATION.

SIXTH ANNUAL MEETING, BOSTON, JUNE 24TH AND 25TH, 1889.

THE sessions were held in the Medical Library Association Hall, Boylston Place. There was a goodly attendance of members, but few guests. The number and importance of the papers read and the discussions thereon will compare favorably with those of any previous meeting. The proceedings were opened at 2 P.M., June 24th, VINCENT Y. BOWDITCH, M.D., President, in the chair. The subject of the President's opening address was the

COMPARATIVE RESULTS IN NINETY CASES OF PLEURISY, WITH SPECIAL REFERENCE TO THE DEVELOPMENT OF PHTHISIS PULMONALIS.

The results of Dr. Bowditch's investigation seem to show that whether it can be proven or not by such statistics that all pleurisies are tubercular, a large percentage of cases, often in apparently chronic forms, recover and never have thereafter any recurrence of the original disease, or the development of any subsequent pulmonary or other tuberculous affection. And that, while undoubtedly there are many cases in which an attack of pleurisy is followed within a comparatively short period of time by pulmonary tuberculosis and therefore suggesting the importance of special care, in all cases, yet such results are not so common as to justify the sweeping conclusion and gloomy prognosis of Landouzy and his followers. On the contrary, the exceptions are sufficiently numerous to justify hope and encouragement in all cases, which every physician should do his utmost to incite and strengthen.

Dr. W. D. HODGES, of Boston, read a paper on

A STUDY OF THE SUMMER CLIMATE OF THE MASSACHUSETTS COAST.

This paper comprised the climatic, and to some extent the local, conditions of twenty-two places, covering a period of

nine years. Water and sandy, loose, compact, and clayey soils were differentiated in their relations to the temperature and moisture of the air and the influence of the winds. The results of the "study" are instructive and eminently practicable for health-seekers.

Dr. F. K. KNIGHT remarked upon the paper that it showed that New England was not a bad place during July and August, at any rate, for invalids to visit, or for patients to return to. The record of facts presented, he thought, ought to convince physicians that they can risk their patients coming home, at least for two months in the summer, with benefit.

D. W. H. DALY, of Pittsburg, Pa., read a paper on

THE WAKEFULNESS OF NEURASTHENIA AS AFFECTED BY A RESIDENCE AT THE SEASIDE; AND ITS SUCCESSFUL MANAGEMENT AND CURE.

Decided opinion was expressed against a resort to the seashore in such cases. The reader claimed that such cases were rarely or never benefited, and that not unfrequently they were aggravated.

Dr. S. E. SOLLY, of Colorado Springs, indorsed Dr. Daly's views, and thought that, as a rule, except in plethoric persons, resort to Colorado or other high altitudes was advisable.

Dr. J. H. PLATT, of Lakewood, N. J., said he had observed that people who lived idle lives slept badly in some very high elevations; and that persons who used their arms, especially, were less subject to insomnia than other persons. He had noticed that in high altitudes many people who suffered from insomnia got well after rowing, or some exercise of that nature. Hence, he thought, there must be some connection between the use of the muscles of the arms and the cortex of the brain, besides the motor centres being situated there.

Drs. A. N. BELL, of Brooklyn, E. F. INGALLS, of Chicago, and WILLIS FORD, of Utica, N. Y., all dissented from the views expressed in the paper, and cited their experience to the contrary, that a resort to the sea-shore and surf bathing was a remedy of great value in insomnia, and according to their observation devoid of the ill consequences attributed to it by Dr. Daly.

Drs. C. W. TOWNSHEND and A. COOLIDGE, Jr., of Boston, read an elaborate paper on

THE MORTALITY OF ACUTE LOBAR PNEUMONIA,

a study of all the cases treated at the Massachusetts General Hospital from 1822 to 1889—1000 cases:

1. There was a mortality of 25 per cent.

2. The mortality has gradually increased from 10 per cent in the first decade to 28 per cent in the present decade.

3. The increase is deceptive for the following reasons, all of which were shown to be a cause of a large mortality:

(*a*) The average age of the patients has been increasing from the first to the last decade.

(*b*) The relative number of complicated and delicate cases has increased.

(*c*) The relative number of intemperate cases has increased.

(*d*) The relative number of foreigners has increased.

4. These causes are sufficient to explain the entire rise in the mortality.

5. Treatment which was heroic before 1850, transitional between 1850 and 1860, and expectant and sustaining since 1860, has not therefore influenced the mortality rate.

6. Treatment has not influenced the duration of the disease or of its convalescence.

Dr. A. L. LOOMIS, of New York, said the paper which had just been read seemed to him to be the fairest and most comprehensive statement of the ratio of mortality in pneumonia for the last sixty years that had been given to the profession. The result reached in the paper was the same as he had long maintained, that pneumonia had not changed its type, its severity, or its ratio of mortality; that it was now what it always had been.

The fact must be recognized that acute lobar pneumonia is an infectious disease, self-limiting; and, like all infectious, self-limiting diseases, but little modified by treatment. There are cases of pneumonia that will die no matter what the treatment, and others that will recover on almost any plan of treatment.

While pneumonia was an infectious disease he did not believe it had a specific microbe which produced it, but that the

microbe which produced typhoid-fever or diphtheria might produce pneumonia.

Dr. H. I. Bowditch, of Boston, suggested that the paper ought to stimulate the profession to try in every way to find some means of preventing the disease, inasmuch as we were unable to cure it by any known treatment.

Dr. F. C. Shattuck, of Boston, called attention to the small number of cases in the first decade, and the influence a small number of cases, if favorable in character or unfavorable, might have on the percentage of mortality. The fact that the mortality had remained stationary at 25 per cent, showed, in his opinion, an improvement in therapeutics in this way: the population of Boston was an extremely homogeneous one in the early years. There was practically not an Irishman in Boston; the town was surrounded by water; there were large open spaces, gardens about the houses, and the sanitary conditions were very good, except, perhaps, in the respect that people had wells and drank well-water, and in these days the well and the back-house were often very near together. To-day the population of Boston was a mixture of all sorts of people, and the tenement-house system was in vogue, owing to the very high price of land, and while the sanitary condition of the upper classes has greatly improved of late years, it was his feeling that the sanitary condition of the poorer and middle classes had not improved to anything like the same extent. It was from the middle, and especially the poorer classes that the mortality was drawn which furnished the figures for these statistics; therefore it seemed to him exceedingly probable that if the mortality rate remained the same to-day that it did fifty or sixty years ago the treatment was much better, otherwise we should have a larger mortality.

Dr. A. L. Loomis, in reply to a question upon what he based his belief that lobar pneumonia was an infectious disease, said: First, because it was a self-limiting disease. Second, because it had an initiatory chill. Third, because it had an almost uniform rate of temperature. Fourth, because it terminated by crisis, as a rule. Lastly, because we had often seen pneumonia occur epidemically, and under certain circumstances he was quite sure it was contagious.

Dr. Charles Dennison, of Denver, Col., called attention

to the prevalence of pneumonia in malarious districts as an evidence of its infectious nature. In the census of 1870 the States which gave the largest percentage of deaths from pneumonia were those known to be malarious.

Dr. A. COOLIDGE, Jr., of Boston, said, in closing the discussion, that what Dr. Shattuck had said about the small number of cases in the first few years was true. There were only fifty cases between 1822 and 1829, and only five deaths, or a mortality of 10 per cent. The average age was less than twenty-six years in that decade. In the next decade the average was almost thirty.

One cause of the increase in mortality was undoubtedly due to the difference in the age of the patients who come to the hospital now from what it was earlier. A great many now were fifty years of age and over. The paper had considered only acute lobar pneumonia.

Dr. E. P. HURD, of Newburyport, read a paper on

CONSUMPTION AS I HAVE KNOWN IT.

In studying the march of consumption in New England Dr. Hurd selected the city of Newburyport, Mass., an old-fashioned New England city, which was remarkably free from malarial and other zymotic diseases, but was exposed to chilly winds and inclement weather, and thus presented suitable climatic conditions for the development of consumption. He compiled statistics of the mortality from pulmonary phthisis in that city for the past twenty-five years.

The lesson taught by these statistics was that consumption was far more prevalent among foreigners than among natives; as far as the latter were concerned there was a gradual decrease in the death rate from this disease. The relative infrequency of consumption among the descendants of families that had many generations been fixed to the soil was a conspicuous fact. He had observed that a condition of debility did not invariably precede the attack, nor did every debilitated youth become a victim to phthisis. In some cases the lungs, naturally delicate, might be weakened by exposure to severe atmospheric changes and succumb to the microbe of phthisis, albeit the other organs and tissues might be in a good state of nutrition. In other instances the lung might be the soundest

part of a feeble and sickly organism and sturdily resist every destroying agency. Excessive dampness and moisture, especially cold dampness, was an undoubted factor of considerable importance.

Dr. A. L. LOOMIS said he thought Dr. Hurd had thrown out some very strong arguments in his paper. It seemed to him that the facts and statistics, especially the family statistics, went to show that pulmonary phthisis was not a contagious disease.

Dr. W. B. PLATT, of Baltimore, read a paper on

THE INFLUENCE OF CLIMATE AND SEASON UPON THE MANIFESTATION OF NORMAL AND ABNORMAL NERVOUS ACTIVITY.

He said : "Chorea has been shown to be far more common in cool than in warmer climates ; to be more frequent in February and March than in December, for instance. The attacks in the cases observed appeared to have no relation to the rise or fall of the barometer, to the rainfall, or to the thermometer, excepting as the relative rise is greater in the spring than in other months. The number of attacks show a remarkable coincidence with the number of storm-centres passing within seven hundred and fifty miles of Philadelphia.

"Chorea might be defined as a disease of childhood and youth characterized by chronic, intermittent, muscular twitchings, without loss of consciousness, often accompanied by endocarditis, and caused by an irritation of the cerebral motor ganglia. It is a disease of cities rather than of the country, of whites rather than of blacks, of females rather than of males, of the spring months and of cool climates.

"Infantile paralysis has been found to be immensely more frequent in Philadelphia in the hot than in the cooler months.

"Concerning suicide it may be seen at a glance that race has much to do with its frequency. Negroes very seldom commit suicide. Savages have such an immunity from suicidal impulse that it might, in general, be defined as one of the diseases incident to civilization. The influence of climate and season upon suicide is most remarkable ; it is at a minimum in the colder months, increased in frequency during the hot and dry season, and remains high during the rainy season. One factor is age. Forbes Winslow has shown that the ten-

dency to suicide first appears at from ten to fifteen, is most frequent from fifty-five to sixty-five, and among females from sixty-five to seventy-five, in Great Britain. An imperfect education appears to be worse in its suicidal tendency than ignorance. Sex is another important factor, it being much more common in males than in females. Religion and the lack of it, seems to have an important bearing. Imitation is an important exciting element in suicide.

"In neurasthenia more cases are observed to occur in the spring months than at any other season."

Dr. W. E. FORD, of Utica, did not think we were able to say that as to suicides climate had anything like as much to do with its production as the social conditions of the people.

The majority of suicides in New York State occurred among the native farmers, and oftener in the fall than at any other time of the year, and it was supposed to be due to the hard work of the summer and to malnutrition.

As to chorea there was an unquestioned relation between climatic conditions and the production of the disease, and especially the changes of season.

He would hardly like to subscribe to the theory that climate had anything to do with the suicidal tendency, except as governing the habits of life.

Dr. A. L. GIHON, M.D., Medical Director U. S. Navy, read a paper on Ocean Therapy, and Dr. A. N. BELL, of Brooklyn, N. Y., one on the Influence of an Ocean Atmosphere on a Staid Population, with Special Reference to Pulmonary Consumption. Both of these are printed in full on other pages of this number.

Dr. HENRY I. BOWDITCH, of Boston, read a paper on

OPEN-AIR TRAVEL AS A CURE AND PREVENTIVE OF CONSUMPTION, AS ILLUSTRATED IN THE HISTORY OF A NEW ENGLAND FAMILY.

This paper was remarkable for its singularly explicit demonstration. The traveller was a physician, who at the time he set out was in an advanced stage of pulmonary consumption, but in the possession of a strong and healthy will. He resolved upon travel in an open buggy over the hills of New England as a *dernier ressort*, despite the protestations of

friends. At the end of his first day's journey he was so nearly overcome that his friends tried hard to induce him to turn back. But he "felt better" and persisted, and from day to day recorded the progress of his improvement *pari passu* with his journey. He travelled several hundred miles, particularly enjoyed bacon and eggs as a diet, and on the termination of his journey was so far advanced toward recovery that it went on to completeness. He lived many years afterward and finally died of a totally different disease, leaving a family of children notable for their healthiness and long life, and the number of their descendants.

Dr. JOHN C. MUNROE, of Boston, read a

REPORT OF TWENTY-FOUR CASES OF ACUTE MILIARY TUBERCULOSIS.

The cases have been taken from the records of the Boston City Hospital. All the cases were fatal, occurring within the last five years, and only those in which a post-mortem examination was made have been chosen. The number is too small to attempt to draw percentage conclusions, and some factors generally considered of importance have been passed over because of insufficient data. Fourteen patients were male, with an average age of thirty-eight years, that of the females, not including one child two and one half years old, being only thirty-two years. The oldest, a man, was sixty-five years of age. Eight were between the ages of forty and sixty years. Over one half were born on or near our eastern shore; two were negroes. The majority were ill in February, March, and April. Their occupations were of various kinds, and apparently had no causative influence. Only three gave a phthisical family history. In twelve it was not phthisical, while in nine no history could be obtained. Three-fourths of all the patients had always been well up to the time of the present illness, and, although in thirteen cases the autopsy revealed a chronic tuberculosis in addition to the acute miliary process, yet of this group only a single patient had given a history of having suffered from phthisis. Among the exciting causes might be mentioned the following: overwork and exposure in a damp cellar, several weeks of hard drinking, with but little food, partial asphyxiation, measles, scarlatina, whooping-cough

with measles and vaccination, each in one case. About one-third of the cases gave a clear history of a marked chill ushering in the disease. A few more complained of feverishness and malaise, while headache was pronounced in a few others. Loss of flesh, strength, and appetite, wherever noted, came on rapidly and were very marked. Likewise night-sweats were always profuse.

DR. FREDERICK I. KNIGHT, of Boston, read a paper on

THE CLIMATIC TREATMENT OF BRONCHIAL ASTHMA.

If one seeks information on the selection of a suitable climate for an asthmatic patient, he will soon realize that no successful attempt has been made to establish indications for preference of one climate over another for any given case of asthma, that changes of climate have been made usually in an experimental way, and have been often attended with aggravation of the symptoms. The chief cause of this has been the mistake which has been made in trying to reduce all cases of asthma to one class, assuming that the ultimate cause and mode of development of this symptom was the same in all cases. This has led to the origin and promulgation of different theories which have been in turn advocated and abandoned.

It will appear that, in climatic as in medical treatment, we must make an examination to ascertain the condition of the patient as far as it is possible to diagnosticate this, and not treat the name of the disease. There is no climate which is good for all cases of asthma, and we must carefully consider, when the patient presents himself for treatment, the nature of the factors in his case, which of them we intend to modify, and how far change of climate may be able to aid us in this.

(*To be continued.*)

EDITOR'S TABLE.

☞ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, 113A Second Place, Brooklyn, N. Y.

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THE AMERICAN PUBLIC HEALTH ASSOCIATION.

Of the forthcoming meeting of this Association at Brooklyn, October 22d–25th, and the promised "EXHIBITION OF EVERYTHING AVAILABLE ADAPTED TO THE PROMOTION OF HEALTH," in conjunction therewith, the arrangements are progressing favorably; and, at the time of this writing, the prospects of an unusually interesting meeting are auspicious.

The special subjects of consideration, as already announced: The Causes and Prevention of Infant Mortality; Railway Sanitation; Steamship Sanitation; Methods of Scientific Cooking; Yellow-fever Prevention; the Prevention and Restriction of Consumption and Diphtheria—the, at present, most Destructive Diseases; Compulsory Vaccination and the Sanitation of Asylums, Prisons, Jails, and other Eleemosynary Institutions, are of primary importance in the promotion of the public health. Moreover, these subjects are so intimately related to the most important commercial as well as social interests of the people throughout the country, that they can hardly fail to attract deserved attention.

Of the EXHIBIT: Its purpose is to afford object lessons in practical sanitation by every available means; to afford the people an opportunity of making themselves acquainted with devices of all kinds calculated to promote health and comfort; designs for improved dwellings, heating, ventilating, lighting, plumbing, and furniture; plans for improving school buildings and appurtenances in the promotion of the health of the pupils; designs, models, and health-saving devices pertaining to workshops, factories, and occupations; clothing material

and dress ; foods and their preparation ; plans for drainage, sewerage, and water-supply, including means of purification, filtration, etc. ; laboratory and biological instruments and apparatus ; antiseptics, disinfectants, and destructors ; in short, as much of every thing as practicable of interest to the people in the promotion of personal health and public health administration.

In anticipation of large local interest among the three million of population hereabout, the exhibition is advertised to keep open until December 1st. Applications for space, or for other information on the subject, should be addressed to Dr. E. H. Bartley, Secretary of the Committee on Exhibits, 21 Lafayette Avenue, Brooklyn.

THE PROGRESS OF INFECTIOUS DISEASES AND MORTALITY RATES AT THE MOST RECENT DATES, BASED UPON OFFICIAL AND OTHER AUTHENTIC REPORTS.

ALABAMA.—*Mobile*, 40,000 : Reports 78 deaths during July, of which 23 were under five years of age. Annual death-rate, 23.4 per 1000. From zymotic diseases, 13, and from consumption, 13.

CALIFORNIA.—For the month of July, 1889, the Secretary's abstract of the reports received from 100 cities and towns, with an aggregate population of 803,550, the number of deaths was 897. Annual rate, 13.32. Deaths from consumption during the month, 129. From zymotic diseases : Diphtheria and croup, 18 ; typhoid-fever, 29 ; typho-malarial-fever, 4 ; cerebro-spinal-fever, 13 ; diarrhœal diseases, 39 ; whooping-cough, 11 ; scarlatina, 1.

San Francisco, 300,000 : During the month of July the number of deaths was 443. From zymotic diseases, 41. From consumption, 70.

Los Angeles, 80,000 : 59 ; from zymotic diseases, 15 ; consumption, 6.

Oakland, 55,000 : 44 ; from zymotic diseases, 11 ; consumption, 6.

San Diego, 32,000 : 12 ; from zymotic diseases, 1.

Sacramento, 35,000 : 28 ; from zymotic diseases, 5 ; consumption, 3.

CONNECTICUT.—The Secretary reports for July, 1889, 1329 deaths, from 166 towns, comprising a population of 756,572, representing an annual death-rate of 21.0. Deaths under five years of age, 602. Deaths from zymotic diseases, 510. From consumption, 127.

New Haven, 85,000 : total deaths, 137. From zymotic diseases, 62 ; consumption, 17.

Hartford, 52,000 : total deaths, 90. From zymotic diseases, 50 ; consumption, 7.

Bridgeport, 46,000 : total deaths, 64. From zymotic diseases, 43 ; consumption, 6.

Waterbury, 34,000 : total deaths, 38. From zymotic diseases, 35 ; consumption, 10.

DISTRICT OF COLUMBIA.—Total deaths during four weeks ending July, 27th, 491, of which 214 were under five years of age. There were 230 deaths in the colored population. Annual death-rate, white, 22.61 ; colored, 39.84 ; total population, 28.36. Zymotic diseases caused 176 deaths and consumption, 58.

FLORIDA.—*Jacksonville*, 30,000 : Reports for July 62 deaths, of which there were from diarrhœa and dysentery, 3 ; fevers, 7 ; whooping-cough, 1. Annual death-rate, 24.8 per 1000.

Pensacola, 15,000 : Reports for four weeks ending July 27th, 33 deaths, of which 14 were under five years of age. Annual death-rate, 29.34 per 1000. There were 17 deaths from zymotic diseases.

ILLINOIS.—*Chicago*, 1,100,000. For the month of July the Commissioner of Health reports : Total number of deaths 1958, of which 1238 were under five years of age. Annual death-rate, 21.36 per 1000. From zymotic diseases there were 754 deaths, and from consumption, 131.

IOWA.—*Des Moines*, 55,000 : For the month of July, consumption, 5 ; typhoid-fever, 1 ; diphtheria, 1 ; measles, 1. Total deaths, 38. Annual death-rate per 1000, 8.20.

Keokuk, 16,000 : Consumption, 6. Total deaths, 30. Annual death-rate, 22.5.

Dubuque, 35,000 : Consumption, 1. Total deaths, 30. Annual death-rate, 12.8.

Davenport, 33,715 : Diphtheria, 5 ; membranous croup, 2 ; consumption, 1. Total deaths, 24. Annual death-rate, 8.5.

LOUISIANA.—*New Orleans*, 254,000 : During the four weeks ending July 27th there were 549 deaths, of which 201 were under five years of age. Annual death-rate per 1000, whites, 25.71 ; colored, 41.29 ; total population, 28.19. From zymotic diseases there were 99 deaths, and from consumption, 52.

MARYLAND.—*Baltimore*, 500,343 : During the four weeks ending July 27th there were 987 deaths, of which 608 were under five years of age. Annual death-rate, 25.66 per 1000. There were 447 deaths from zymotic diseases, and 61 from consumption.

MASSACHUSETTS.—*Boston*, 420,000 : There were 1044 deaths during July, of which 536 were under five years of age. Annual death-rate, 29.82 per 1000. From zymotic diseases there were 343 deaths, and from consumption, 113.

MICHIGAN.—For the month of July, 1889, compared with the preceding month, the reports indicate that diarrhœa, cholera morbus, cholera infantum, dysentery, and inflammation of bowels increased in prevalence.

Compared with the average for the month of July in the three years, 1886–88, bronchitis increased, and cholera infantum, cholera morbus, and dysentery were less prevalent in July, 1889.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of July, 1889, at twenty-six places, scarlet-fever at thirty places, typhoid-fever at eighteen places, and measles at thirteen places.

Reports from all sources show diphtheria to have been reported at three places more, scarlet-fever at seven places less, typhoid-fever at two places more, and measles at six places less than in the preceding month.

Detroit, 250,000 : Reports 442 deaths in July, of which 152 were under five years of age. Annual death-rate, 20.81 per 1000. From zymotic diseases, 201, and from consumption, 26.

MINNESOTA.—Distribution and mortality from specified diseases in Minnesota for the month of June, 1889, as reported up to July 20th. (Population, estimated 1889, cities over 2000 inhabitants, 539,000 ; towns and villages, 1,047,860.)

Total number of deaths, 820, a decrease of 27 compared with last month—426 males, 394 females ; 56.22 per cent occurred in cities of over 2000 population. Ages : Under one year, 33.65 per cent ; one to five years, 12.8 per cent ; five to fifteen years, 8.9 per cent ; fifteen to thirty years, 14.5 per cent ; thirty to fifty years, 11.48 per cent ; fifty to seventy years, 9.51 per cent ; over seventy years, 8.65 per cent. Of 276 deaths under one year old, 68.84 per cent were in cities ; from one to five years, 59.04 per cent in cities. Scarlet-fever, 26 deaths ; diphtheria and croup, 49 ; typhoid-fever, 17 ; diarrhœal diseases of children, 73 ; bronchitis, 10 ; pneumonia, 37.

Small-pox was reported in Tamsen Township, Clay County, on July 11th, five cases occurring up to July 27th, with no deaths.

St. Paul, 180,000 : Reports for the month of July 260 deaths, of which number 199 were under five years of age. Annual death-rate per 1000, 17.00. From zymotic diseases there were 129 deaths, and from consumption, 13.

MISSOURI.—*St. Louis*, 440,000 : Reports for July 696 deaths, of which 340 were under five years of age. Annual death-rate, 18.96 per 1000. From zymotic diseases there were 179 deaths, and from consumption, 51.

For the year 1888 there were reported 9015 deaths, of which 3629 were under five years of age. Death-rate, 20.49 per 1000. From zymotic diseases there were 2133 deaths, and from consumption, 800.

NEW JERSEY.—*Paterson*, 85,000 : Reports 215 deaths during July, of which 126 were under five years of age. Annual

death-rate, 30.6 per 1000. There were 98 deaths from zymotic diseases, and 18 from consumption.

NEW YORK.—July is always the month of greatest mortality in this State. Of 368,000 deaths occurring during the last four years, more than 40,000, or about 11 per cent occurred in July, and of the 62,700 deaths that have been reported during the seven months of this year 10,650 occurred in this month. This increase is due to the excess of diarrhœal diseases over that of any other month. During the past four years 38 per cent of the mortality from this cause has occurred in July. The infant death-rate has corresponded. During four years 37 per cent of the deaths have occurred under five years of age; 53 per cent of the July deaths have been infantile. During the present month 51.4 per cent of the deaths are infantile, and about 28.5 from diarrhœal diseases. There is a rather marked increase of deaths from typhoid-fever over the average for July. Scarlet-fever, measles, and whooping cough show considerably less fatality than a year ago. Small-pox has been brought to Albany, contracted from the travelling case from Colorado spoken of in the last *Bulletin*, and three cases have developed. From consumption 93.22 deaths occurred in each 1000 deaths from all causes, and 190.40 per 1000 over five years of age. The mortality of several localities, particularly in the maritime district, is much increased by a large transient summer population.

New York, 1,571,558: There were 4333 deaths, of which 2502 were under five years. Annual death-rate, 32.46 per 1000. From zymotic diseases there were 1735 deaths, and from consumption, 421.

Brooklyn, 821,525: Total deaths, 1954—1178 under five years. Annual death-rate, 28.00. From zymotic causes, 641, and from consumption, 164.

Buffalo, 230,000: Total deaths (four weeks ending July 27th), 390, of which 233 were under five years. Annual death-rate, 19.22. From zymotic diseases, 152, and from consumption, 41.

Rochester, 110,000: Total deaths, 264—151 under five years. Annual death-rate, 28.80. From zymotic diseases, 109, and from consumption, 20.

Albany, 103,000: Total deaths, 223, of which 101 were under five years of age. Annual death-rate, 25.98. From zymotic diseases, 63, and from consumption, 26.

Syracuse, 80,000: Total deaths, 200—85 under five years of age. Annual death-rate, 30.00. From zymotic diseases, 101, consumption, 14.

The five towns showing the highest rates of mortality were Newtown, 51.60; Portchester, 42.00; Gravesend, 40.00; Cobbleskill, 32.40; Middletown, 30.00.

The five lowest were Fort Edward, 2.45; Ellisburg, 2.49; Brockport, 2.66; Clayton, 2.78; Salem, 3.31.

NORTH CAROLINA.—Aggregate population of the towns reporting for the month of July was 140,800, of which 61,915 were colored. Total deaths 196, of which 123 were colored. Deaths under five years, 83, of which 53 were colored. Annual death-rate, 10.8 in the white population, 22.8 colored, and 16.8 in the total population per 1000. From zymotic diseases there were 70 deaths, and from consumption, 24.

Wilmington, 23,000: Total deaths, 49. Annual death-rate per 1000, 25.2.

Charlotte, 11,000: Total deaths, 23. Annual death rate per 1000, 24.0.

Asheville, 10,000: Total deaths, 14. Annual death-rate per 1000, 16.8.

OHIO.—Fifty-one cities and towns, with an aggregate population of 1,149,800, reported to the State Board of Health for the month of July 1651 deaths, of which 822 were under five years of age. Annual death-rate, 17.22 per 1000. From zymotic diseases there were 612 deaths; consumption, 160.

Cincinnati, 325,000: Total deaths, 566; under five years, 298. Annual death-rate, 20.90. Zymotic, 176; consumption, 60.

For the year 1888 there were 5994 deaths, of which 2279 were under five years of age, or 38.04 per cent of the total mortality. Annual death-rate, 18.44 per 1000. From zymotic diseases there were 1196 deaths; consumption, 746.

Cleveland, 225,000: Total deaths, 375; under five years, 228. Annual death-rate, 20.00. Zymotic, 174; consumption, 26.

Columbus, 101,000: Total deaths, 143; under five years, 59. Annual death-rate, 16.99. Zymotic, 53; consumption, 21.

For the year ending March 31st, 1889, there were 1222 deaths, of which 409 were under five years of age. Annual death rate, 13.14 per 1000. From zymotic diseases there were 346 deaths, and from consumption, 169.

Toledo, 89,000: Total deaths, 89; under five years, 48. Annual death-rate, 11.10. Zymotic, 35; consumption, 3.

Dayton, 60,000: Total deaths, 74; under five years, 31. Annual death-rate, 14.80. Zymotic, 19; consumption, 12.

Mansfield, 15,000: First annual report for the year ending February 28th, 1889, gives the total number of deaths 99, of which 34 were under five years of age. Annual death-rate, 6.6 per 1000. There were 23 deaths from zymotic diseases, and 12 from consumption.

PENNSYLVANIA.—*Philadelphia*, 1,040,245: Reports for four weeks ending July 27th, 2036 deaths, of which 1123 were under five years of age. Annual death-rate, 25.5 per 1000. From the principal zymotic diseases there were 515 deaths, and from consumption, 173.

Pittsburg, 230,000: Reports 126 deaths during the two weeks ending July 20th, of which number 123 were under five years of age. Annual death-rate, 25.00. From zymotic diseases (exclusive of diarrhœal), there were 19 deaths, and from consumption, 6.

RHODE ISLAND.—The number of deaths recorded in the different towns and cities, during July, from which returns have been received, was 569, of which 288 were under five years of age. The towns making returns represent an estimated population of 294,060. The annual death-rate upon the estimate given is 23.2 per 1000. There were 240 deaths from zymotic diseases, and 51 from consumption.

Providence, 127,000: Reports for July 278 deaths, of which 145 were under five years of age. Annual death-rate, 26.27. From zymotic diseases there were 111 deaths, and from consumption, 26.

Newport, 22,000: Reports for July 19 deaths, of which 6 were under five years of age. Annual death-rate, 10.36 per

1000. One death was reported from zymotic disease; consumption caused 2.

TENNESSEE.—The principal diseases, named in the order of their greater prevalence, in the State for July were: Malarial-fever, dysentery, diarrhœa, cholera morbus, cholera infantum, and consumption.

Typhoid-fever is reported in the counties of Bradley, Cannon, Davidson, Franklin, Giles, Grundy, Henry, Knox, Madison, Marshall, Maury, Montgomery, Overton, Robertson, Shelby, Smith, and Stewart. Whooping-cough in Blount, Davidson, Giles, Henderson, Knox, Lawrence, Madison, Maury, and Robertson. Scarlet-fever in Davidson, Knox, Rhea, Robertson, and Shelby. Measles in Davidson and Robertson. Conjunctivitis in Crockett almost epidemic.

In the chief cities the respective annual death-rates for the month per 1000 of population are reported as follows:

Chattanooga,	white,	11.10;	colored,	24.92	: 15.60
Clarksville,	"	24.00;	"	20.00	: 22.50
Columbia,	"	12.00;	"	20.00	: 16.80
Knoxville,	"	14.36;	"	34.37	: 18.45
Memphis,	"	20.24;	"	19.94	: 20.11
Nashville,	"	10.61;	"	26.24	: 16.20

WISCONSIN.—*Milwaukee*, 210,000: Reports for the month of July 255 deaths, of which 64 were under five years of age. Annual death-rate, 14.6 per 1000. From zymotic diseases there were 52 deaths, and from consumption, 24.

YELLOW-FEVER and its congeners.

Havana: Of the 583 deaths in this city during the month of July, 63 were from yellow-fever, 39 from so-called pernicious-fever, 8 from paludal-fevers, and 20 from enteric-fevers.

A MENACE TO PUBLIC HEALTH—SMUGGLERS ON THE FLORIDA COAST.

PENSACOLA, FLA., August 2, 1889.

Surgeon-General John B. Hamilton:

MY DEAR SIR: The exigency calls for plain speech; I will try to give it to you.

When our Legislature was holding its " extra session," and incubating a " State Board of Health," I gave Senator Parkhill some notes of warning as to the weak points in our sanitary defence, and wished them covered by the statute. It seems that the Board has had ample authority to prevent communication with law-breaking people, especially by sea. Imagine my surprise to learn, on this 1st day of August, 1889, that there is no defence or protection *attempted* against the thousand and one smugglers coming from Cuba with aguardiente, textile fabrics, . . . and such *diseases* as a constant state of filth, animal and vegetable, engenders. In every hour of the day some person or persons could be caught smuggling if proper efforts were made. The United States customs department *should* prevent it, but they virtually have but one tub for 600 miles of coast, and she of such draught as to be compelled to keep gunshot away from nine out of ten of the localities used by the smugglers. It is a very poor farce poorly played " How not to do it."

When they see the smoke of the steamer in the distance they virtuously fish for groupers ; when the danger is past they run in and see their friends. You will say this is all talk. No ; I saw some of it in March, in the neighborhood of Tampa, and within a week one of my friends sailing up the coast saw five vessels grown so bold as to fish within two to four miles of the coast, so as to be " handy by" when night came.

One of them landed his cargo at Cedar Keys (without entry), another was bold enough to run in and anchor behind Anclote Key, then proceeded toward Cedar Keys, and was seized by the cutter within four miles of the land, *fishing*.

* * * * * * * *

A small sailing-vessel, with one rifled howitzer and with a crew of ten determined men, would, in thirty days, knock the dangers clear across the Gulf Stream in the direction of Cuba. Offer a reward of $100 for every smuggler, $200 for every vessel seized, and the coast would be alive with " Argus-eyes," and *safety* would be assured.

Now, there is in every day that passes some traffic with vessels not six days from Havana or some infected port in Cuba.

" I have kept silent until my bones roared within me," like

old Job, and so I open my mouth in order that others may open their eyes. I am full of the proofs of what I utter. I have heard the parties boast of smuggling persons into Florida without health certificates from Spanish authority (and of course without domestic entry). The price received was $100 each for twenty-one persons, and all was accomplished in twenty-four hours.

Where the profits are large and easy, human nature becomes pliant.

I hope this will warn *you* as it has the writer.

Yours, very sincerely,

SEWALL C. COBB.

(From Surgeon-General Hamilton's *Weekly Abstract*, August 13th, 1889.)

SMALL-POX in foreign cities at most recent dates is reported as follows: Four weeks ending July 27th, Paris, 9 deaths. Two weeks ending July 27th, Havre, 1. Four weeks ending July 20th, Lyons, 4; Prague, 13; Warsaw, 21; Lemberg, 4. Two weeks ending July 15th, St. Etienne, 1. Three weeks ending July 13th, Venice, 9. Four weeks ending July 11th, Cairo, 24; Alexandria, 7.

OBITUARY.

DR. JAMES LAWRENCE CABELL, of the University of Virginia, died August 13th, 1889, in Albemarle County, Va., at the summer residence of his adopted daughter, Mrs. E. B. Smith. He was born in Nelson County, Va., August 26th, 1813, and hence was within two weeks of being seventy-six years of age. His great-grandfather, Dr. William Cabell, was a surgeon in the English Navy, who emigrated to Virginia about 1720, and from whom the now very extensive family residing in Virginia, Kentucky, and other Southern and Western States has descended.

Dr. James L. Cabell's primary education was received from private schools in Richmond, Va. In 1829, he entered the University of Virginia as an academic student, from which institution he graduated as Master of Arts in 1833. He at once began the study of medicine in the University of Mary-

land, from which university he graduated as Doctor of Medicine in 1834. He next pursued chemical studies at the Baltimore Almshouse and then in the hospitals of Philadelphia, and afterward went to Paris, where he further pursued his medical studies.

During the winter of 1837, while in Paris, he received information of his election as Professor of Anatomy, Physiology, and Surgery in the Medical Department of the University of Virginia; and, on his speedy return to Virginia, he at once began upon the duties of his professorship. In 1839, his chair was so divided as to give off Anatomy, the late Dr. John Staige Davis being elected to take charge of that, along with Materia Medica and Therapeutics. Dr. Cabell continued as Professor of Physiology and Surgery until his death.

In 1839. Dr. Cabell married Miss Margaret Gibbons, who died in 1874. They had no children, but adopted two daughters—one, the cousin of his wife, who is now Mrs. E. B. Smith, of Richmond, Va., and the other is Mrs. H. B. Auchinoss, of Orange, N. J.

Until 1858 he contributed but little to literature, when he published his book on the "Unity of Mankind," in answer to Nott's & Gliddon's book, entitled "Types of Mankind." This latter work advocated the doctrine that all races are not descended from the same source, while Dr. Cabell showed that such teaching was not supported by lessons of science.

In July, 1861, he was assigned to duty as surgeon in the Confederate Army, in charge of the hospitals of Charlottesville, Va., and so remained (with the exception of some four months in 1862, when he had temporary charge of hospitals in Danville, Va.) till the close of the war in 1865.

In the fall of 1865 he resumed active duties again as Professor in the University of Virginia, the Medical Department of that institution having temporarily suspended during the latter part of the war.

In 1873 he had conferred upon him the degree of LL.D., by Hampden-Sidney College, Virginia.

He materially aided in the organization of the Medical Society of Virginia in 1870, of which he became President in 1875, and was afterward elected an Honorary Fellow of the same.

He gave a great deal of effort to the establishment of the Virginia State Board of Health in 1871, and was elected its President, and nominally so remained till his death. But neither this Board nor its friends have ever been able to remove from the law which established it the clause which practically kills it, namely: "Provided, said State Board of Health shall not be an expense upon the State." He has been a member of the American Medical Association since its organization, and has always been prominent in its interests. He was a great help in the establishment of the National Board of Health, of which he was President. He was also President of the American Public Health Association for one year.

Dr. Cabell had been in failing health for a year or more. Last spring he offered his resignation as Professor in the University of Virginia, but the Board of Visitors declined to accept it; and in view of his long, efficient, and eminent services continued him as Professor with salary, and elected Dr. Paul B. Barringer, of Davidson College, N. C., as Assistant Professor.

In July Dr. Cabell went to the White Sulphur Springs and returned to Charlottesville about the 15th of that month. Then he went to spend the season at the country seat of Major E. B. Smith, in Albemarle County, not far off. While it was not expected that he would ever be able to again resume active duties, his death was rather sudden, being due to some stomach trouble, recently developed as the result of failing health, which prevented the powers of assimilation and nutrition.

His remains were laid to rest in the University of Virginia Cemetery, August 16th.

Dr. Cabell was a member of the Episcopal Church. His influences for good were directed by intelligence of mind and purity of heart. His life-work was devoted to the interests of the University of Virginia, and its prominent position among the educational institutions of this country is greatly due to his wise counsels and his indomitable energy. He was the senior member of the Faculty.

His life is ended; his work is done; but the influences of that life and the results of that work will leave their impress upon a generation yet unborn.

MEDICAL EXCERPT.

MUSCULAR RHEUMATISM.—Grinewitsky reports the successful treatment of this disease in Russia by hypodermic injections of osmic acid. He uses a one per cent solution and injects from eight to fifteen drops. When the larger dose is employed the relief is much more prompt; but in any case the results are certain, and a cure obtained after six or eight injections. Grinewitsky discovered the use of the acid by accident. He was treating a patient for violent lumbar pain with injections of a five per cent solution of cocaine, but by mistake gave a large dose of a one per cent aqueous solution of osmic acid. Violent pains were felt for more than two hours subsequently, but they were followed by complete relief from pain in the loins, and the patient remained free from further suffering. Three injections of eight to fifteen drops of a one per cent solution gave complete relief to a patient suffering with lumbago and muscular rheumatism of the lower extremities.—*Journal de Médecine de Paris.* *T. P. C.*

BROMIDIA.—DR. LUD MARC, of St. Nazaire-sur-Loire, writes that he has used the bromidia (Battle), and that the results he has obtained have been excellent. That it combines all the advantages of other preparations of this nature, while at the same time it possesses none of their disadvantages. The fact that it produces no unpleasant sensation on awaking renders it specially valuable.

THE GREEN DIARRHŒA, so common in infancy and childhood, is of special interest during the warm months. The mortality in all large cities is inordinately increased by this disease, and in Paris it causes more than one hundred deaths a week. This has recently been the subject of an interesting address by Professor Hayem before the Academy of Medicine. He considers the disease due to the presence of a peculiar bacillus, previously pointed out by Professor Damaschino,

in the matter vomited and in the alvine discharges. This microbe is said to be caused by disturbance of the digestion, so that the stomachic fluid becomes neutral or alkaline in reaction, a condition which favors the development and rapid multiplication of the bacillus. The proper treatment is, therefore, to restore the natural condition of the gastric secretions by the administration of acids.

Hydrochloric acid is generally unsatisfactory and often without result. *Lactic acid* is the only agent that acts promptly, generally restoring the healthy condition in two or three days.

It is very important that the lactic acid should be obtained from milk and not the artificial compound formed by the action of alkalies on glucose, which is cheap and generally found in the shops.

In the simple diarrhœa of infants, often resulting from the exhaustion or the debility of the nurse, the administration to her of the syrup of the lactophosphate of lime causes the vomiting to cease and restores the healthy action of the bowels. This result is due, no doubt, to the restored health of the mother and the consequent improvement in the quality of the milk.

Experiments have further shown that by this treatment, in the case of the nurse, the amount of the phosphate of lime in the milk was increased to two or three times the original quantity, thus not only increasing the nutritive qualities of the milk, but making it a useful remedial agent for the sick child.—*La Semaine Médicale. T. P. C.*

CHLORIDE OF BARIUM IN THE TREATMENT OF HEART DISEASE is attracting considerable attention. Haze reports its use in seven cases, with notes, as follows : Once, in a child six years old, with mitral lesion ; once, for acute dilatation of the heart ; in two cases of aortic lesion ; in one of mitral lesion in an adult ; and in two cases of functional disturbance. The results were satisfactory. In every case the remedy lessened the frequency of the heart's action, rendered it more regular, and increased its volume ; while, to the touch, the tension was less than that produced by digitalis. The pulsation was notably prolonged. There was no renal disturbance.

The author gives, of an aqueous solution of one per cent, from twenty to thirty minims three times a day to a child ;

and seventy minims two or three times a day to an adult. Given in these doses it is perfectly harmless. Besides, it is not disagreeable to the taste; is cheap, and acts as promptly as digitalis.—*Les Nouveaux Rémèdes.* *T. P. C.*

GARDNER'S SYRUP OF HYDRIODIC ACID, which has been for several years, and continues to be a remedy of high repute in the treatment of various forms of asthma and bronchial affections generally, contains 6.66-100 grains of iodine in each fluid ounce, or 6.712-1000 grains of absolute (gaseous) hydriodic acid (HI), which is equivalent to 8.69-100 grains of iodide of potassium.

Dr. William C. Wile, editor of the New England *Medical Journal*, in a paper on the "Uses of Hydriodic Acid in General Practice," read by him before the American Medical Association at Cincinnati, 1888, says that "The difficulties which were in the way of the use of hydriodic acid because of its rapid decomposition were considered so insurmountable that it was not until the year 1880, when an unalterable syrup was presented to the profession, that it came into use. Soon after this, in 1880, my attention was attracted to an article by Dr. J. P. Oliver, of Boston, which was published in the Boston *Medical and Surgical Journal* of the issue of March 4th of that year.

"Dr. Oliver, in his paper, alluded to the use of syrup of hydriodic acid in the treatment of asthma, and, in conclusion, says that Dr. F. I. Knight 'had surprisingly satisfactory results' from the same remedy."

Dr. William Judkins, of Cincinnati, has reported remarkably satisfactory results of its use in hay-asthma. Dr. James Craig, of Jersey City, reports its use in numerous cases of acute inflammatory rheumatism, and prefers it to any other remedy.

Dr. F. A. Burrall, of New York, commends it as an excellent method for exhibiting iodine in glandular enlargements and other diseases in which that remedy is indicated.

As a rule it is found desirable to administer the syrup of hydriodic acid before meals, say half an hour previous to eating.

Doses: In hay-fever, asthma, chronic bronchitis, catarrhal affections, and where the object is to relieve local inflamma-

tory conditions, it is better to begin with small doses, say half a teaspoonful in a tablespoonful of water, and gradually increase until the alterative action upon the mucous surfaces has given the desired relief.

It should not be prescribed in combination with alkalies, as they would be at once converted into iodides ; nor with oxidizing agents, as the hydriodic would be changed into iodic acid, which is poisonous, and produces toxic effects ; nor with metallic salts generally.

OXYGEN IN THE TREATMENT OF PHTHISIS.—The inhalation of oxygen has been recommended. More than a century ago, it was observed by Priestley and Beddoes that oxygen did harm in certain cases of phthisis. In acute phthisis, the form which has been termed phthisis florida, the blood may be hyperoxygenated. Oxygen should not be given under such circumstances or where there is fever. But where there is no fever, and where the conditions in the lung interfere with the oxygenation of the blood, benefit may be obtained from the inhalations of oxygen properly regulated. In those cases in which there is an increase in oxygen, it was recommended a few years ago, that the amount of oxygen be diminished by the use of carbonic acid gas introduced into the system more especially by rectal injections. Clinical experience has not confirmed the extravagant claims made for this treatment.—*Professor Woodbury, Philadelphia Medical Register.*

THE PREVENTION OF PHTHISIS.—At a meeting of the Epidemiological Society, of London, held January 9th, 1889, Dr. J. E. Squire read a paper on this subject, stating that phthisis depended primarily upon the reception into the body of an infective particle or micro-organism ; but a lowered vitality of the tissues placed them in a more favorable condition for the development of the bacillus, and thus constituted in the individual a predisposition to the disease. The bacillus might gain entrance into the body (1) by inoculation through a cut or scratch ; (2) by means of the genito-urinary mucous membrane ; (3) by the product of conception and by direct hereditary transmission ; (4) by the mucous membrane of the alimentary canal ; (5) by the mucous membrane of the respira-

tory tract, and by the air-cells of the lungs. Dr. Squire gave, as the fundamental principles which must form the basis of any successful attempts to diminish the prevalence of phthisis, (1) to provide a sufficiency of fresh air in and around dwellings and work-places; and (2) to endeavor to improve the resisting power of the individual by physical training during the period of growth and development, and by exercise and recreation alternating with the work of maturer age. As the effects of phthisis were handed down by hereditary transmission from parent to child, any causes which tended to increase tubercular disease among the adult members of a population must be regarded as tending to produce a progressive deterioration of race.—*The British Medical Journal, January 26th,* 1889.

IDENTITY OF ERYSIPELAS AND ACUTE LYMPHANGITIS.—Drs. Verneuil and Clado conclude from their experiments (1) that erysipelas and acute lymphangitis are two forms of one and the same affection. (2) The same microbe occurs in both, and is readily found, cultivated and inoculated in animals.—*Bulletin de l'Acad. des Sciences, April 8th,* 1889.

DANGER OF THE SUSPENSION TREATMENT OF LOCOMOTOR ATAXIA.—Dr. Vincent, of Clifton Springs Sanitarium, recently hanged himself unintentionally while experimenting with the Sayre suspension apparatus, which many physicians are now making trial of in the treatment of locomotor ataxia. This unfortunate accident is not the only one, for word comes from France that a man living in the Department of the Dordogne, who was suffering with locomotor ataxia, met his death in the same way. Both these deaths occurred while the persons were alone. The apparatus appears to be free from danger when it is employed under the watchful eye of the physician or in the presence of a skilful attendant.

IMMEDIATE RELIEF OF HOARSENESS.—The first Napoleon is said to have been subject to sudden attacks of severe hoarseness, for the immediate relief of which his physician was in the habit of prescribing the following, known as Foreau's syrup:

℞	Liquor, Ammoniæ fortioris.........	♏x
	Syrupi Erysemi....................	f℥iss
	Infusionis Tiliæ Florum............	f℥iiss
M.	To be taken at one dose.	

Erysemum officinale (*sisymbrium offic.*), or hedge-mustard, is no longer officinal, but is easily obtained. It is a small annual, growing almost everywhere in the United States and Canada, as well as in Europe. The infusion of linden (tilia) is used simply as an agreeable vehicle, and may be dispensed with or supplanted by any other pleasant vehicle.—*St. Louis Medical and Surgical Journal, May*, 1889.

FOR A COLD.—T. G. Davis, M.D. (*College and Clinical Record*), says that he has success with the following combination, which for greater elegancy he has had put in triturate form by H. R. Mulford & Co., of Philadelphia :

℞	Tinct. aconiti rad..................	♏ 1-5
	Tinct. bryoniæ.....................	♏ 1-10
	Tinct. belladonnæ..................	♏ 1-10

If quinsy or tonsillitis threatens he can usually abort it by alternating with the above carbonate, gr. $\frac{1}{100}$ every two hours, and a gargle of borax in hot water.

VOICE LOZENGE.—Dr. Hinkle, according to the *Chemist and Druggist*, March 30th, 1889, recommends the following formula as the best for a "voice lozenge" in the ordinary hoarseness of singers and speakers. A small piece should be allowed to dissolve in the mouth just before using the voice :

Cubebs............................	$\frac{1}{2}$ grain
Benzoic acid......................	$\frac{1}{8}$ "
Hydrochlorate of cocaine...........	$\frac{1}{10}$ "
Powdered tragacanth................	$\frac{1}{4}$ "
Extract of liquorice...............	5 grains
Sugar..............................	13 "
Eucalyptol.........................	$\frac{1}{4}$ minim
Oil of anise.......................	$\frac{1}{20}$ "

Black currant paste, enough to make 20 grains.

LITERARY NOTICES.

THE INDEX-CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE, U. S. ARMY. Volume X., edited by JOHN S. BILLINGS, Surgeon U. S. Army, maintains the same excellent characteristics as the preceding volumes. It comprises 7658 author-titles—O to Pfutsch—representing 2905 volumes and 7282 pamphlets. It also includes 14,265 subject-titles of separate books and pamphlets, and 29,421 titles of articles in periodicals. Washington: Government Printing Office.

ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES: A YEARLY REPORT OF THE PROGRESS OF THE GENERAL SANITARY SCIENCES THROUGHOUT THE WORLD. Edited by CHARLES E. SAJOUS, M.D., and Seventy Associate Editors, assisted by over two hundred Correspondents and Collaborators. Five vols., 8vo. Numerous Chromo-Lithographic Illustrations, Engravings, and Maps. 1889. $15 per annum. F. A. Davis, Publisher, Philadelphia, New York, and London.

The new features and improvements in this, the second year's publication of this comprehensive work, as compared with the first, are that the foreign weights and thermometric measurements have been reduced to those generally used in this country. Grammes have been reduced to ounces, drachms, grains, etc., and Centigrade degrees to Fahrenheit, both appearing side by side.

The dates of all journals referred to are mentioned in the text, and an index has been added to each volume, besides the complete triple index at the end of the entire work, thus greatly facilitating research.

The "Therapeusis" column of the index presents a *résumé* of all remedial measures introduced or recommended during the year. *Dosage* not furnished by the original author, and therefore not to be found in the text, has been inserted by the editor of the therapeusis column.

The practical worth of each article has been increased by giving a careful description of treatment, operations, etc.

Two new departments have been added, "Examination for Life Insurance" and "Railway Neuroses," subjects of great importance to a large proportion of the profession.

Altogether, the volumes have been made less clumsy, notwithstanding the additions, by closer calendering of the paper and avoidance of unnecessary blank spaces in the text.

As a time-saving repertory and summary of the year's progress in all the departments of medicine, both curative and preventive, the work is remarkable for its completeness and the facility with which the busy practitioner may refer to all that has been added. The publisher's work is also admirably well done, and alike commendable.

INEBRIETY: ITS ETIOLOGY, PATHOLOGY, TREATMENT, AND JURISPRUDENCE. By NORMAN KERR, M.D., F.L.S., Fellow of the Medical Society of London; President, Society for the Study of Inebriety; Chairman of British Medical Association Inebriates' Legislation Committee; Consulting Physician, Dalrymple Home for the Treatment of Inebriety; Corresponding Member, Medico-Legal Society of New York, of the American Association for the Cure of Inebriates, etc. Second edition. 12mo, pp. 503. London: H. K. Lewis, 136 Gower Street, W. C.

However physicians may differ with regard to the etiology and treatment of inebriety, they cannot well afford to be unacquainted with the reasoning of those who believe it to be essentially a *disease*, and treat it accordingly. The volume before us comprises an exhaustive study of the subject from that point of view—considers its nature, etiology, and, so far as it can be made to appear, analogy to other diseases; its varieties, pathology, and treatment; and its medico-legal aspects. The views expressed are fortified by numerous well-chosen examples calculated to sustain the preconceived conclusion with which the work sets out, and to give much comfort to drunkards who are encouraged to hold their parents responsible for their own sins. That the progeny of drunkards are feeble-minded and possess but little resisting power to disease in all its aspects, is common knowledge; and this

is enforced, but with less discrimination, it appears to us, than the results justify.

That the hereditary drink-impulse is in some cases irresistible by the individual is undoubtedly true; but this is no evidence against the more general truth that inebriety is for the most part the result of voluntary action, even among the progeny of drunkards, and wholly so among those who are not, hence the too sweeping conclusions of this author that inebriety, at the outset, should be treated as a disease—pampered and apologized for—instead of a crime against nature and society, is, in our judgment, erroneous.

The work is admirably gotten up, with marginal notes and a copious index which render it unusually convenient for reference.

ALDEN'S MANIFOLD CYCLOPÆDIA. Volumes X. and XI., Cosmography to Dominie, like those which have preceded, are replete with the essential significations of words and special descriptions of subjects of interest to all readers. For example, under Dairy we have summed up the dairy business generally, in the United States, the annual value of dairy products, differential regions, breeds of cows, yield of milk, plans of dairying, etc., six pages; Darwinian Theory, the gist of the whole subject, fourteen pages; Development, Diet, and Digestion, ten, seven, and twenty-two pages, respectively, appropriately illustrated; all admirably condensed, but lucid as all the rest. Fifty cents a volume; half morocco, 65 cents. If by mail, 10 cents extra. John B. Alden, 393 Pearl Street, New York.

A LABORATORY GUIDE IN URINARY ANALYSIS AND TOXICOLOGY. By R. A. WITTHAUS, A.M., M.D., Professor of Chemistry and Physics in the Medical Department of the University of New York; of the Medical Department of the University of Vermont, etc. Second edition. New York: William Wood & Co. Of the excellence of this manual we have before had occasion to speak on the first edition. It continues the best work of the kind.

HINTS ON HOUSE BUILDING. By ROBERT GRIMSHAW, author of "Grimshaw on Saws," "Saw Filing," "Modern

Milling," and numerous other manuals. Second and enlarged edition. 16mo, pp. 77. Price, 50 cents. New York: Practical Publishing Co., 21 Park Row. The title of this little book well expresses its character. It may be read with profit not only by those who ought to and are about to build houses, but by housekeepers, particularly by those who live in the country.

MERCK'S BULLETIN for June, 1889 (delayed a few weeks in publication), contains a highly valuable *table of maximal doses*—by grains and grammes—for one hundred and thirteen of the *newer remedies*, for the majority of which no reliable dose limits have hitherto been published in this country. Moreover, of this publication, generally, no physician should be without it. 73 William Street, New York.

PALLISIER, PALLISIER & CO.'S CATALOGUE OF PERIODICALS ON ARCHITECTURE AND THE KINDRED ARTS, is necessary to all architects, designers, builders, and others, who would be informed of the progress of periodical literature on the subjects to which they are devoted and where to obtain it. Pallisier, Pallisier & Co., 24 East Forty-second Street, New York.

THE PROFESSIONAL CANVASSER NO. 3. A thirty-two-page pamphlet combining a price-list of the scientific medical periodicals of the United States, and a concise consideration of the subject, "What can be done with old books?"

Applicants for copies are solicited to remit six cents to cover cost of postage, etc.

Address all communications to Frederick D. Van Horen, 23 Clinton Place, New York.

F. A. DAVIS, of Philadelphia, has in press a new work on the PRACTICAL APPLICATIONS OF ELECTRICITY IN MEDICINE AND SURGERY. By Dr. G. A. LIEBIG, Jr., of Johns Hopkins University, and Professor George H. Rohé, of the College of Physicians and Surgeons of Baltimore.

The work will be fully illustrated by engravings and original diagrams.

LIFE IN JAPAN.—In Japan women have always held a higher position than in other Asiatic countries. They go about freely wherever they please, and the seclusion of the Chinese is wholly unknown to them. The schools receive as many girls as boys ; and as a result of my observations I can safely say, without idle compliment, that the former are brighter than the latter.

By degrees, and under these favorable conditions for general observation, some of the causes of the people's happy spirit of independence began to be revealed to me. The simplicity of their lives, in which enters no selfish rivalry to outdo one another, accounts in a large measure for this enviable result. Regarding one another very much as belonging to one family, their mode of life is more or less on the same plane, and consequently a spirit of great harmony prevails. A very small income is sufficient to supply the ordinary necessities of life, and everything else is secured with but little effort. Household effects are few and inexpensive ; and should everything be destroyed by fire or lost in any way, it is not an irreparable calamity. All can be replaced at a small outlay and life go on as before.

The tenant upon renting a house is put to little expense to furnish it ; indeed, he requires absolutely no furniture at all. The clean, finely woven mats which cover the floor serve as table, chair, and bed ; and as it is the universal custom to remove the shoes before entering a house, there is no danger of one's bringing with him the dirt from the streets.

His bedding consists of cotton quilts, which are spread out on the floor at night, rolled together in the morning, and stored away in a closet during the day. A few pictures (*kakemona*) and specimens of beautiful script decorate the walls, a few vases contain sprays of flowers, and a number of cushions on the floor complete the furnishing of a room. Yet it does not seem empty or cheerless ; for the general arrangement of harmonious colors, the different woods employed in its visible construction, and the beauty of the finished workmanship, make a most harmonious and pleasing combination. Paint is never used to cover the wood, much less to substitute a false grain.—*Theodore Wores, in the Century for September.*

THE QUESTION OF STEAM-HEATING FOR CARS.—This whole matter of steam heating is still in a somewhat crude state, and it does not seem desirable to force it by legislation. It has been demonstrated that it is the cheapest way of heating trains, and the most easily regulated; and it has become a good advertisement to attract passengers. Consequently the whole subject may be safely left in the hands of the railroad companies, and allowed to develop itself naturally in a business way. There is not yet any system of continuous heating so perfected that a railroad company could without hardship be compelled to adopt it for all its passenger equipment.—*From "Safety in Railroad Travel," by H. G. Prout, in September Scribner.*

PAMPHLETS, REPRINTS, REPORTS, ETC., RECEIVED.

"On the Influence of Certain Conditions upon the Sprouting of Seeds." Bulletin of the Agricultural Experiment Station, VII., July, 1889.

"On the Effect of Different Rations on Fattening Lambs." Bulletin of the Agricultural Experiment Station, VIII., August, 1889.

"Report upon Tuberculosis and Its Prevalence among Neat Cattle of Rhode Island." Prepared by Charles H. Fisher, M.D., Commissioner of Health; Secretary of the State Board of Health; State Registrar of Vital Statistics, Providence, R. I.

"Yellow-fever: A New Treatment. A Forecast for 1889." Wolfred Nelson, C.M., M.D., late Board of Health, Panama, etc.

"Accumulators and their Use." Robert Newman, M.D., New York.

"Prolapse of the Womb." Lewis H. Adler, Jr., M.D., Philadelphia, Pa.

"Therapeutic Uses of Oxygen and Nitrogen Monoxide." The S. S. White Dental Manufacturing Company, New York.

"Pelvic and Abdominal Drainage." "Expression in the Treatment of Trachoma." A. E. Prince, M.D., Jacksonville, Ill.

"The Disposal of the Dead." John M. Peacock, M.D., Brooklyn, N. Y.

"Report of the Secretary of the Observatory, and that of the Astronomer in charge of the Heliometer." Yale University, New Haven, Conn.

"The Kings County Medical Association's Discussion on Diphtheria." A Review by Avery Segur, M.D., Brooklyn, N. Y.

"Treatment of Naebus by the Intrainjection of Alcohol." Thomas H. Holgate, M.D., New York.

"The Radical Cure of Hernia." Thomas W. Kay, M.D., Scranton, Pa.

"Bulletin of the Agricultural Experiment Station, VI., June, 1889: I. On the Determination of Hygroscopic Water in Air-dried Fodders; II. The Determination of Nitrogen by the Azotometric Treatment of the Solution Resulting from the Kjeldahl Digestion; III. Fodders and Feeding Stuffs." Cornell University, College of Agriculture, N. Y.

"Is more Conservation Desirable in the Treatment of the Joint Diseases of Children?" A. B. Judson, M.D., New York.

"Scarlatinous Otitis." Charles H. May, M.D., New York.

"Report of St. Mary's Hospital." Brooklyn, N. Y.

"The Seguin Physiological School for Feeble-Minded Children." Twelfth Year. 260 West Fifty-fourth Street, New York.

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THE PRESENT STATE OF LOCAL AND GENERAL KNOWLEDGE OF SANITARY SCIENCE, AND OF THE ECONOMIES OF ITS APPLICATION.*

By Sir EDWIN CHADWICK, K.C.B., formerly Chief Executive Officer of the first General Board of Health; Corresponding Member of the Institute of France; President of the Association of Public Sanitary Inspectors of Great Britain; etc.

GENTLEMEN: I regret very much my inability to attend personally your present Congress. At this time I am subjected to overwhelming demands of attention, abroad as well as at home; these demands are intended, as much to endeavor, by the presentation of experiences, to stay the wastefulness of ignorance and of expensive and obstructive works as to advance the large pecuniary economies of current sanitation, and they have left me no opportunity of doing what I would wish, for which I must crave your indulgence.

The Paris correspondent of the *Lancet* states that the members of the Congress of Forensic Medicine were very superior to the members of the Congress on Hygiene, who really knew very little about hygiene, and were learners rather than teachers. This condition of the want of knowledge is but too true and too extensive. The matured instructions prepared for the last generation have been neglected or lost to the present generation. The last report of the Inspector of Workshops under the Factory Act represents that the greatest obstructions met with for the application of improved methods of ventilation and sanitation show an entire ignorance of sani-

* Address read at the Conference of the Association of Public Sanitary Inspectors of Great Britain, held at Folkestone, September 5th, 1889.

tary principles on the part of the wage classes, whom it will benefit, as well as of the employers of the workpeople, whom it will profit. It is recommended that the principles of sanitation should be introduced into elementary education. Over and above the obstructions arising from the ignorance of the wage classes in regard to their greatest practical benefits, we have the ignorance of party politicians of high position, who have never given due attention to the subject, for requisite legislation and administration, and whose attention is impeded by the increasing pressure of other subjects, from which they feel the need of relief. This leads to an impatience of anything newer and larger with which they are unacquainted, and so they let the greatest silent preventive measures for the relief of misery go on, and adopt the demonstrated false doctrine of Malthus, that pestilence is the "natural check" to that increase of the population by which they are bewildered; and that sanitation is an untimely interference with that natural check—an immensely false doctrine, which I have dealt with at length in a paper recently read before the Political Economy Club of London. Some practical consequences of such states of ignorance have been the notable expensive features characterized by the Commission appointed to inquire into the charges of the impurities thrown into the Thames, of which Commission Baron Bramwell was the President, and who pronounced that the condition of the river was a "disgrace" to the metropolis and to civilization. I wrote thereupon a paper, in which I showed that works on correct principles might have been executed, and might yet be executed at one half the expense, with, among other advantages, a saving of an estimated quantity of milk of upward of two hundred thousand of cows effected for the population of the metropolis. It appeared to me to be a case for the application of the old common law categories for "misfeasance, malfeasance, and nonfeasance," and for responsibilities for them enforced. It was not for me to undertake the service of a public prosecutor, and I submitted it to Lord Herschell, but he, without denying it, declined to undertake it. I would, however, present an example of how acts of misfeasance are brought about. It has been the opinion of railway, or dock, or harbor engineers, who are not sanitary scientists, that the only method of discharging

the sewage of a town is by natural gravitation, *i.e.*, by discharging it into a river or the sea. This is what has been done with the sewage of Hastings. Now such practitioners are necessarily not conversant with self-cleansing house drainage, or rather self-cleansing sewers, or of the difference between fresh sewage, which feeds fish, and putrid sewage, which destroys fish, or drives them away. They discharge the sewage as they find it in its common state of putridity. This is what has been done with the sewage of Hastings, of Brighton, and of other towns, to the injury of the fisheries and the loss of the milk, as I may show, from simple inability or from ignorance how to do the work. Sir Robert Rawlinson was engaged, and he got out a plan for Brighton by which every street would have been resewered with fitting sewers and the sewage conducted in the direction of demand for its application at no greater expense than the tunnel sewer, which the local authority was led to adopt for throwing the sewage into the sea. Sir Robert's exposition, I must say, was on that occasion not so good as would have been required for the inhabitants of Brighton by action under our Board, but it ought to have been respected. The tunnel sewer has proved to be a sewer of deposit of the old sort, and by it, I was assured by an eminent physician there, cases of fever were introduced where they had never been before. The fish were in the sea far away ; but the engineer is stated to have got a fee of seven thousand pounds for his work. My belief is, from experiences in our Board, that the work might have been done for a tenth of that sum, plans included. In illustration, however, of the notions of official work prevalent in the Treasury, I may mention that, during the cotton famine, Sir Robert Rawlinson laid out three quarters of a million of money in sanitary work for the towns for forty thousand of the unemployed, of whom, however, only seven thousand availed themselves of the proffered opportunity. The work was really productive, and the money has long since been repaid ; but it was thought at the Treasury that he might have done all that work only for his salary, and it was deemed very liberal on their part to give him a thousand pounds for his extra service. But if it had been done regularly, and, as great George Street would have deemed, done properly, at five per cent of the regular

remuneration, the expense would have been eighty-seven thousand five hundred pounds. I may give further illustrations to show that the Treasury has an agency for economizing the means of economy on the largest scale. Hastings and a number of other towns have been led to follow the wasteful and expensive example. It has yet to be observed by the specialist, or the water engineer, or the sanitary engineer, that steam power carries water up hill and down dale, over every inequality, to the tops of the highest houses, and to every flat in them, and maintains a constant high pressure, night as well as day, at the same time abolishing cisternage and stagnation. It may be seen by the evidence of witnesses whom I examined, that in my time by a large Cornish engine upward of one hundred thousand gallons could be raised one hundred feet high for a shilling. But the Messrs. Quick are now showing in Holland that by the improvement of the steam-engine, with small engines of not more than twenty-five horse-power, one hundred and fifty thousand gallons are raised at that same expense, a shilling. The exercise of this power is now much cheaper than cartage for raising solid manure by cartage for the fertilization of the land. It appears that it has yet to be understood that this same steam power is available for the constant removal and distribution of fouled water or manure undecomposed and fresh, constantly up hill and down dale in the direction of demand. Thus, in the case of Hastings, I have pointed out that by the concentration of the manure to a sump, they may raise their manure up hill for two or three miles or turn and radiate it in the direction of demand of land obtainable at suitable price. Of the exercise of fresh power one example is presented by the small town of Pullman, near Chicago, where immediately available land not being eligible, manure is carried to a distance of more than two miles by steam power for distribution on suitable land, and where it is distributed with a return of profit, a profit in the United States. In other respects that small town presents for study a valuable example of sanitary power. Its death-rate is reduced to eight in a thousand.

You will see it stated in my work just issued on "Circulation or Stagnation" that in parts of Greece the old system is continued of the "Rebecca" going to a well three quarters of

a mile distant to fetch water twice a day in pots holding two gallons each; which act costs, at the least, twopence for a fifth of the day's work. The cost of the power may be exemplified in the instance of the British metropolis. Water is, in one instance, collected from springs thirty miles distant; in another instance, it is conveyed, after filtration, through pipes, from sources more than twenty miles distant; and a constant supply, at high pressure, is given in each instance, that will carry thirty-two gallons per head to the tops of the highest apartments, for a rate of three fourths of a farthing per head.

Now, even that rate of charge—which is the subject of contestation in Parliament as excessive—is so cheap as to make it dear and wasteful for the poorest housewife to go down from the top of any house to the bottom to pump water at the basement (if the water were to be had gratis) and carry up sixteen pailsful to the top. Indeed, if the supplies were delivered only at the basement, the cost of carrying them to the other rooms would evidently exceed all the rates, *i.e.*, the three fourths of a farthing per head now paid for it, or the full farthing per head, for which the companies are now in effect contending. Nevertheless, if the measure of the first General Board of Health had been carried, as I believe it will yet have to be, the same service per diem would have been actually rendered for half a farthing per head. Supposing the pitcher of a Rebecca to hold two gallons or twenty pounds of water, a labor equivalent to that of sixteen of her journeys to a distant spring would be rendered for half a farthing by a few millions of capital invested in machinery and guided by science. To aid the conception of the economy of labor by this power, it may be stated that one Cornish hundred-horse engine, working one hour per day, would do the work of fifty thousand Rebeccas.

And yet of this, less than one twentieth of the Rebeccas, though of the labor of some two thousand years ago, to which science and capital now render the cost of the daily supply of the metropolis, more than two thirds will be found to be an oppressive waste, pumped into the stagnation of fouled water, to the injury of the public health, by stagnation in the subsoil. The reduction of this enormous and injurious waste, it will be

found, would remove half the intakes from the polluted Thames. Bringing the supplies of the metropolis under unity on a public footing would, for the largest areas, be an economy in the interest of the companies everywhere, as well as of the public.

An illustration on this point might be added from Great Malvern, which I got Dr. Lory Marsh to examine, when he reported it to have attained a death-rate of eight in a thousand. To these may be added one of our first towns dealt with, of Rugby, which had a death-rate of twenty-four in a thousand, and is now under twelve in a thousand ; also Matlock, with but imperfect works, which was once nineteen in a thousand and is now nine ; and also of several places of which I have not yet obtained particulars, except of Leek, which presents the great example of a reduction of the death-rate, with an augmentation of the life-rate to nine years per one thousand in twenty years.

Of the assumed omni-competence, by the influence of which on the sewerage of London all previous inquiry was set aside, the discharge by what was called the "natural" system of discharge, with all its fatal consequences in the production of stagnant sewage, was adopted. It is proper to note, as an illustrative fact, that by the reliance on the assumed omni-competence of the railway engineer, Lord Palmerston was led into the fatal mistake, for this country, of assuming that the cutting of a canal across Suez was impracticable or ineligible.

I might, if this were the place, display the combination of interests in expense, in the House of Commons, and, by what Lord Palmerston himself declared to be as foul a vote as he had ever known in all his Parliamentary experience, when the Government were defeated at a morning sitting on the renewal of the first General Board of Health, and of action upon its collected experiences for administrative economy.

It is in regard to the prevalent ignorance of those experiences, and the dangerous fatal wastefulness and excessive expenses of the yet prevalent ignorance of sanitary principles, that I have felt constrained to be at the untimely labor and expense of an endeavor to recall and restate experiences prepared for a former generation, which appear to be extremely little known to the present generation. With that view, I

have prepared a pamphlet entitled "Circulation or Stagnation," in which I have embodied a very able exposition by an early ally of sanitary principles, made in the year 1856, and have added an account of the achievements made in sanitation since then. What I may expect from this republication is that it may, here and there, meet with some competent and earnest minds in this country, and here and there prove an addition to our present experiences. I have just received a proof of the work, and have transmitted copies to make it known to members of the Congress. That it may prove acceptable to you, gentlemen of the Congress, who may be in a position to act upon the experiences made, will be a great consolation to your faithful servant,

EDWIN CHADWICK.

ON SEWAGE DISPOSAL FOR WATER-CLOSET TOWNS.

By ALFRED CARPENTER, M.D., of Croydon, Eng.

IT is twenty-two years since I introduced a method of treating town sewage to the notice of an assembly of men of science, specially called to consider the subject of town drainage. That was at the congress assembled at Leamington in 1865. I have repeatedly followed up the same subject at various meetings of scientific, medical, and sanitary bodies, always dwelling upon the points connected with the utilization of sewage on land by so-called "broad irrigation." At the International Congress assembled in London in 1881, I submitted in general terms a series of propositions for the consideration of the Congress, and I now venture to restate them for the consideration of this meeting in terms more explicit and detailed.

1. That the application of the sewage of a water-closet town to land in close proximity to dwelling-houses is not injurious to the health of the inhabitants of those houses, provided the sewage be fresh; that it be applied in an intermittent manner, and the effluent be capable of rapid removal from the irrigated fields.

2. The judicious application of sewage to soil of almost any kind, if it be mainly inorganic, will satisfactorily cleanse the effluent water, and fit it for discharge into any ordinary stream, provided the area treated is not less than an acre for each two hundred and fifty persons.

3. That vegetable products grown upon fields irrigated by sewage are satisfactory and safe as articles of food, for both animals and man.

4. That sewage farms if properly managed do not set up either parasitic or epidemic disease among those working on the farm or among the cattle fed upon its produce.

5. That this immunity exists because the conditions necessary for the propagation and continuance of those disease germs which affect man and animals are absent, the microbic life on sewage farms being antagonistic to the life of disease germs, the latter, therefore, soon cease as such to exist.

6. That sewage farms may be carried on in perfect safety close to populations. It is not, however, argued that the effluent water is safe to use for dietetic purposes.

7. That there is an aspect in sewage farming which shows that it is a wise policy for the nation to encourage that form of utilization from a political economy point of view.

8. That to be financially successful such farms require that the rainfall be separated from the sewage; the area large enough for alternate cropping, and the capital employed sufficient to insure a continuous and rapid consumption of the crops produced.

9. That if practicable sewage utilization by surface irrigation should be, for financial reasons, within the area of its own watershed, and close to the populations producing the sewage, but it is not a necessity that it should be so, provided it be applied to the land within a few hours, not more than twelve, of its discharge, and that there is no arrest of movement for more than very short periods before it is so utilized.

Several years have passed away since the matter contained in those propositions were put forth to the medical profession. I now intend to carry on the evidence as to their soundness by reference to the experience which has been gained in various parts of the kingdom, since the last report to a medical body, namely, 1881, but more especially by the results

which have followed its continued application to the same land in my own neighborhood since that time.

There are two facts which no amount of argument derived from the use of chemicals, or the bungling of local authority officials can controvert or deprive of their significance :

1. The utilization of sewage has been carried out on the same land consecutively for thirty years, frequently in a bungling manner, the area, however, being increased as the increase of population required it. Commencing with thirty-six acres only in 1851, it was all but abandoned as an incorrect proceeding, because the quantity of sewage applied was in excess of the power of the soil to deal with it. Three hundred acres were then obtained about the time that I first became connected with the farm. These have been increased by new purchases as the quantity of sewage to be applied from increasing population rendered it absolutely necessary to enlarge the area of application, but the land irrigated for the first time thirty years ago still continues in use, and effects its object as perfectly as on the first application. The subsoil of the farm two feet below the surface shows very little alteration, and three feet below is not in any way contaminated by the continued application of sewage. The various crops grown upon the land take out the manurial properties of the sewage, and allow the soil to continue its purifying power even better than at first. To effect this, however, it is necessary that the cropping be incessant and that the land have occasional rest for a year from sewage application. The tendency of the repeated application of sewage to land is to silt up the lower portion of the subsoil and prevent it acting as a filter below the plough level, except for a short time. It follows, therefore, that the sewage must pass over the land rather than through it, and although intermittent downward filtration may purify the water, it will be temporary only, unless the soil is turned over frequently, so as to allow of its aëration. A sewage farm will bear deep ploughing better than other land, and grow larger crops in consequence.

2. The second great fact is that notwithstanding the very large price paid for the land at Beddington and Norwood, namely, sometimes as much as £300 an acre, or more for some of it, and a total cost of nearly £250,000, it has seldom been

necessary to make more than a *2d.* rate upon the parish to meet all the charges required to be met. The capital raised is now being paid off, but not lost, and in forty years from the last loan, the whole farm will be the freehold of the borough, without any liability at all upon it, paying a fair sum toward the reduction of the rates, and retaining a large open space with abundance of vegetation, in the midst of a large population, and providing a considerable amount of out-of-door work. The capital raised is an investment for the future, and not a scattering of immense sums of money in works which may become useless, like to those now being carried out by the Metropolitan Board of Works at the Thames outfall, by Crossness and Barking.

Let me take the propositions in turn : 1. As to the effect upon health.

I showed that in 1881 the average death-rate for ten years for the Beddington and Wallington district was 14.3. I reproduce the table with additions up to the present time. The deaths have not exceeded in number those in 1881, although the population has risen very considerably, and the births are twenty more than in that year. The ratable value of the district in 1861 was £11,700, in 1871 was £20,671, in 1881 was £41,616, and this year it is returned in the report to Surrey County Quarter Sessions as £47,424, a tangible evidence of the increase of wealth and population around the sewage farm, while the zymotic death-rate last year is 0.5 only, and the average on the last seven years is only 1.2.

As regards its effect upon the health of the borough of Croydon, I showed in 1881 that the average death-rate for the borough was 17.9, and the zymotic death-rate 2.79. In 1886 it was 14.5, and the zymotic death-rate 1.53. In 1887 it was 14.7 and 2.2 respectively, the dry summer increasing the diarrhœa among infants.

I need not follow this head any further except to remark that in February, 1887, I submitted a report upon the subject to the Society of Arts in London, in which I conclusively proved that in no single instance out of nearly 100 cases in which sewage has been utilized by broad irrigation had any fact been proved to establish the allegations of "insanitariness" which are sometimes raised against them.

2. As to the character of the effluent, it continues to be perfectly satisfactory. The analyses which are occasionally made by the local authority establish its maintenance of standard, which is very similar to that given by me to the International Congress, while no questions have been raised upon this point except while the Norwood Farm was overtaxed by excess of sewage. Dr. Angus Smith's report to the Local Government Board in 1879 was to the effect that as regards this form of treatment of sewage, it maintains its position—namely, "that in every respect the best results have been obtained by irrigation."

3 and 4. The third and fourth propositions need not be further discussed, for no proof has been even tendered to the contrary except by Dr. Tidy in his communications to the Society of Arts, which were based upon suppositions made twenty years ago, not upon any solid foundations whatever, a point I was able to prove conclusively in my reply to his paper before the Society of Arts, and to which I have already referred ; and even Dr. Cobbold withdrew his antagonism before his death because it was proved to his satisfaction that it was based upon idea only.

5. The fifth proposition is an important one. It is difficult to prove a negative. I assert that disease germs are of two kinds, corresponding with active germs and resting spores, eggs hatched and growing, and eggs unhatched. The hatched eggs are rapidly destroyed by the physical conditions under which they arrive at the farm ; exposure to air, a lower temperature than that necessary for warm-blooded creatures, absence of pabulum, and presence of injurious gases soon destroy their life, but the resting spores (unhatched eggs) are more persistent. They certainly arrive on the farm, and it might be expected that they would do mischief, and so they do (and would) if the sewage is not immediately applied to the land. But then, if arrested, nature comes to our rescue and destroys them by the sulphuretted hydrogen which is engendered as soon as putrefaction is rampant ; but putrefaction destroys the chance of a satisfactory financial return from the use of the sewage, and it is not to be encouraged. As soon as the resting spores come in contact with the spongioles of plant life they are taken up with avidity, and taken in as food most

energetically, much as human beings take in oysters when they get the opportunity. Some classes of plants, which I have presumed to name "carnivorous,"* among which I place rye grass, do assimilate these germs in the most rapid and satisfactory manner, so that no particle escapes their devouring power, and the effluent, as far as my observation goes, is absolutely free from their presence.

7. The seventh proposition is also a most important one. A local authority buys a site and spends a large sum in erecting tanks and machinery for chemically treating sewage. If they give up the process the whole sum so expended is utterly lost. Not so the sums invested in the purchase of land. The capital is there, and every farthing taken from the rates is either left in the land and raises its capital value by increasing its agricultural power, or sends into the country an additional supply of meat, milk, and vegetables, which make an actual addition to the wealth of the nation, although the locality itself may not apparently benefit by a reduction of taxation. The Corporation of Croydon have at this moment an estate of more than seven hundred acres, purchased for sewage-farm purposes. Its agricultural value has been raised five times over since it has been so utilized, its power to employ labor correspondingly multiplied, to the advantage of the tradesmen and owners of cottage property in the borough, while the housewife has the choice of so much more milk and meat than would have been the case if no farm had existed. Let these conditions be established in five hundred other districts in the kingdom, including London, and pauperism will be correspondingly lessened, because so much more labor will be provided, at least forty thousand agriculturists kept on the land, who are not now employed, the price of milk kept down, while thousands will have it who cannot have it now, and a mass of wealth added to that belonging to the country, which ought to recommend sewage farming to all political economists, who study production and its effect upon population.

8. The financial question contained in the eighth proposition is not medically interesting, but it affects us as ratepayers. I

* *Vide Sanitary Record*, 1875 ; "Power of Soils, Air, and Vegetation to Purify Sewage."

will only remark upon it that the greater the cost the greater the necessity of employing capital upon the land, and the greater the amount of produce raised, the greater the necessity for capital to be utilized in consuming it. The Croydon Corporation blindly allow their committee to waste the produce of the farm by preventing the consumption of produce on the farm, and thus play into the hands of cowkeepers and others, who are able to get it at a cheap rate. This is a monstrous perversion of common sense, which is bearing fruit in the fact that the receipts for produce on the farm, under its increased area, are less in amount than they were before the new land was added to the farm ; but such is one of the penalties a town has to pay for electing representatives unable to deal with these questions from a broader view than that of self-interest for the moment.

9. The last proposition has reference to situation. The sooner the sewage is on the land the better chance for a good result on every point of view. If, however, the sewage has to be pumped, it increases the financial cost, and arrangements must be made for its rapid and continuous removal. If sewage is kept moving it may travel any distance. The farm may be forty miles from the town producing it, but if so removed the town must expect to pay a larger sum for cost of transit. This may be counterbalanced by cheaper cost of land. The expense of pumping can be calculated to within a few pounds, and if the rainfall is kept out of the sewers, and proper allowance made for yard, street, and roof drainage, there need be no difficulty whatever on this head.

I earnestly recommend sewage farming as applicable to all water-closet towns without exception, and feel sure that it will be far more satisfactory for the kingdom at large, when it is so utilized, than for it to be sent into the Thames, the Mersey, or the Clyde, to the gradual destruction of our waterways, and the removal from our midst of that which will give sinew, muscle, bone, and marrow to a people languishing for such material, and in consequence of its scarcity at home at this moment we have to import the material required for its production from the other side of the globe.

THE CHOLERA IN MESOPOTAMIA.

THE correspondent of the *Journal d'Hygiène*, at Constantinople, writes under date of August 8th last that in the beginning of that month the Council of the International Health Association was informed by telegraph that two hundred cases of cholera morbus had occurred in seven days in Chatra, a village on the Chutt and Hay, some distance from Bagdad.

This epidemic was evidently of local origin, for, according to the despatches of August 2d, the pilgrimage to Mecca was made this year under the best sanitary conditions, and it was impossible to trace the disease directly to India.

Active measures were taken by the governors of the surrounding districts to prevent the spreading of the disease to other places by isolating the village. Notwithstanding the announcement has been made by telegraph that the epidemic has extended to Nasrie.

The symptoms attending the disease leave no doubt as to its nature: vomiting, copious diarrhœal discharges resembling rice-water, very low temperature, stiffness of the limbs, thready and almost imperceptible pulse, cramps in the epigastrium extending to the lower limbs, tongue dry and yellow at the edges, anuria and death within forty-eight hours.

Orders were given to cut off all communication from Rout and Hamar on the Tigris, as far as Samara on the Euphrates, with the view of protecting the city of Bagdad. Notwithstanding the precaution two fatal cases have been reported in Bassora.

In consequence of this quarantine stations have been established at regular intervals between Rout and Hamar, on the Tigris, and the native huts, which formed the village of Nasrie, crowded one against the other, have been destroyed by fire. Doctors were sent immediately from Constantinople with full powers to place an effectual barrier to the further spread of the epidemic.

The *Journal d'Hygiène* has requested its correspondent, Dr.

Gabuzzi, of Constantinople, to keep it advised of every change in the situation. It anticipates from this new outbreak of cholera some new developments that may be very instructive to the profession regarding the etiology of the disease.

The following cases were reported up to August 15th. Although the quarantine restrictions were very rigidly enforced and the instructions to the military cordon carried out to the letter, the epidemic becomes more fatal and spreads rapidly.

The first case occurred in Bagdad on August 14th, and all the country along the Euphrates from Samara to Kourna is infected; the following are the deaths: in Chatra (4000 inhabitants), from July 27th to August 13th, 341 deaths; in Nasrie, from August 1st to 13th, 412 deaths; in Bassora, from August 6th to 14th, 202 cases and 95 deaths; in Rumlyta, from August 8th to 13th, 50 deaths.

The correspondent's letter, dated Constantinople, August 29th, gives alarming intelligence; cholera continues to advance more and more rapidly. It was confined to the south of Mesopotamia during the first part of August, but later the epidemic has ascended to the Tigris with fearful rapidity, and appeared in Bagdad on August 14th. To-day all the district surrounding Bagdad toward the south as far as Bassora and to the north as far as Hanejuine is infected.

The banks of the Euphrates, from Rousma as far as Mussayeb, are stricken. The city of Bagdad is desolate; it is almost entirely abandoned. The inhabitants are encamped around the city or have migrated toward the north. On August 25th 100 deaths were reported, of which 93 were from cholera. In the territory overrun by the epidemic the mortality up to the present has been 2050. Hospitals and sanitary stations have been established in order to protect the country north of Bagdad.

The official reports received to September 3 from Nasrie and Bassora show a progressive diminution in the number of deaths from cholera; there were only three on September 1st. But the scourge is spreading rapidly in the territory lying between the Tigris and the Turco-Persian frontier. There has been a notable diminution in the number of deaths in Bagdad, but the exodus of the population must be kept in mind; the very severe cases are still the rule and recoveries are the exception.

Of the two military cordons established to the north of the city, one extends to the Turco-Persian frontier; the other, still farther north, crosses the Tigris and terminates at Deir on the Euphrates. The correspondent concludes that

"Although from conviction a strong partisan of the origin of Asiatic cholera in British India, I must admit with regret that so far in this case no fact nor information has been received which tends to confirm this etiology."

Here it should be remarked that, in a note added to the first communication from Dr. Gabuzzi, the *Journal d'Hygiène* says: "We may add that the ideas regarding the origin of the epidemic advanced by Dr. Gabuzzi are not held by us, as may be seen from the pamphlet on the subject which we presented to the Society in his name on August 9th, entitled, Dr. G. Gabuzzi de Constantinople: "*Le choléra, la cause efficiente de sa virulence et de sa contagion.*" Broch. in 8°.

"The author considers it a well-established scientific fact, 'that the point of departure or the origin of Asiatic cholera in Europe is in British India, and belongs chiefly to the region which is watered by the Ganges and the Brahmapootra.'"

The *Journal d'Hygiène* adds: "Our correspondent in Constantinople informs us, September 10th, that cholera has made still further progress toward the north of Mesopotamia during the last week. Many journals, both political and medical, give their readers the benefit of the news furnished by the *Journal d'Hygiène*, and not only neglect to give us credit, but also suppress the name of the attentive correspondent who has had the kindness to send us the facts so regularly.

"'Crossing the Diala, cholera morbus has passed beyond the first sanitary cordon extended from Sélanié to Zehrit, and on September 2d appeared at Zissyne, on the 4th at Selèmié, the 7th at Bomadi on the Euphrates, and on the 8th at Kerbouk.

"'The disease is specially fatal among the Arabs. The sanitary cordons have been extended farther to the north. The first extends along the Tigris and the Euphrates, while the second penetrates into the province of Mossoul in order to protect the city of Van.

"'The official bulletins give the mortality in the country invaded by the scourge as about 4000, 3923 being the actual number of deaths as reported; but this figure is certainly

below the truth, because it is impossible to register all the cases of cholera exactly, and the number of deaths among infatuated people cannot be obtained."

Cholera continues to prevail in the Philippine Islands also, according to the most recent accounts. *El Siglo Medico* of September 8th, 1889, says that, according to the returns which are supposed to be official, and rather reduced than increased, from May 1st to July 11th there were 22,397 cases: 1133 in Pampanga, 407 in South Camarenes, 467 in Cavite, 259 in Morong, 1221 in Tanlac, 5344 in Panganiran, 2000 in New Ecija, 1065 in Negros, 1089 in Capir, and 9412 in Ilo-Ilo.

At present there is no later news from the capital, but it is reasonable to suppose that the number of cases has been greatly reduced, because the medical attendance has been greatly increased and the sanitary conditions have been much improved.—*T. P. C.*

Perfumes and Fragrant Flowers are said, by Unger (*Farmacista Italiana*), to exert a highly salutary influence for the prevention of pulmonary diseases; insomuch that a residence in a perfumed atmosphere has been known to prevent the development of phthisis; and, moreover, to be an effectual remedy in the treatment of that disease. Seven persons, he says, who were affected with phthisis, were placed under the influence of perfumes, rapidly recovered, although their cases were previously pronounced hopeless by several experts.

In support of this opinion, Unger says that in the city of Grasse, the Flower Garden of Europe, phthisis is exceedingly rare. He attributes the immunity to the vapors given off by the perfume distilleries, which are very numerous.—*T. P. C.*

The Officers-elect of the American Climatological Association for the ensuing year are as follows:

President, Dr. Charles Denison, of Denver, Col.; Vice-Presidents, Dr. J. R. Leaming, of New York, and Dr. W. H. Baker, of Lansing, Mich.; Secretary and Treasurer, Dr. J. B. Walker, of Philadelphia; Council, Dr. F. H. Bosworth, of New York, Dr. F. C. Shattuck, of Boston, Dr. R. G. Curtin, of Philadelphia, Dr. F. I. Knight, of Boston, and Dr. S. E. Solly, of Colorado Springs, Col.

The next place of meeting, Denver, Col.

HEATING AND VENTILATION OF PUBLIC BUILDINGS.

By Thomas Elkinton.

In the sixth month number of the *Student*, for 1888, was published an article furnished by me at the request of the editor on the subject of "Ventilation," which treated of a few general principles, and of their applicability to dwellings and other buildings, but the scope of the article did not cover more than the commencement of the subject and did not touch upon any of the methods of accomplishing the desired results.

It is a hopeful sign that the public mind is becoming more and more awake to our needs for improved ventilation in large buildings and to realize that while good progress has been made in civil and mechanical engineering, and much attention paid to architecture and substantial building, sanitary engineering and hygiene have been greatly neglected.

Probably one reason for so little progress having been made in these matters is that in the first place the problems are really very difficult ones to deal with, and the ability to deal with them, though obtained partially by study, comes better by more extended and continued observation than is usually given to it, and very unfortunately, ventilation is a subject on which one is tempted to enjoy a confidence inversely as the extent of his knowledge.

With every one thus the director of his own ventilation and his own plans of hygiene, the demand for persons skilled in the profession in these lines has heretofore been very limited, and buildings for generations have been erected with but little provision for a proper air supply for the inmates; and, as a result, the hygienic condition of most of our buildings is far from creditable to an age pretending to civilization and refinement.

Professor Morse, in his "Japanese Homes and their Surroundings," remarks that a Japanese "would look upon the usual public gatherings of our people in lecture-halls, school-rooms, and other closed apartments . . . as filthy in the extreme." A judgment which the sooner we realize as correct, and the sooner we aim to render untrue, the better for our general health.

As a rule, the offices in which business men spend most of their time become very foul when the weather requires the windows closed ; lecture-rooms generally dismiss their audiences in profuse perspiration, and with lungs which have been bathed with the exhalations of many others ; and court-rooms and other places of mixed assemblages hold their occupants and attenders for hours in an atmosphere totally unfit for the health of human beings.

These evils being apparent to the most careless observer, and the necessity for improvement partially acknowledged, the next step is the arousing of public interest to the point of declining to rest short of their removal, and to publish methods by which this may be effected.

As above intimated, the first idea to dismiss, is that properly heating and ventilating a large building, as it should be done, is an easy thing to accomplish, and that while we must not stop short of good results, far in advance of what we have as an average been heretofore contented with, we must realize that perfection is a matter of the future, or at least not of the immediate present.

He who deals with currents of air finds, in its elasticity, laws of motion, temperature and moisture, features which baffle him at unexpected turns, however long his experience and close his observation.

Experience, however, does teach, and knowledge is power, even when dealing with air, and although we may be but upon the threshold of what we may in the future accomplish in heating and ventilating our buildings, we have already enough at command, if we will but use it, to vastly increase our physical comfort and welfare, and may leave to our successors to improve as they can upon our methods and appliances.

Another matter to be dismissed from the public mind is the idea that heating and ventilation are to be satisfactorily ob-

tained without paying a reasonable price for both plant and maintenance.

Too often is it the case that the expenditure of a few thousand dollars for matters of architectural effect or decoration of interiors is borne with greater equanimity than the expenditure of an equal amount for the more useful appliances of a good and healthful air supply for the inmates.

It is not well to build and finish offensive to the eye, but much better to fail to please the eye than to fail of an adequate food for the lungs, and to entail consequent impoverishment of the blood.

To heat without ventilation may be done at comparatively little cost, but as the ventilation for large and continuous occupancy means the changing of the volume of air at short intervals, the cost will be greater, though not in proportion to the number of changes and not in proportion to the increased benefit.

Fifty years ago, buildings were heated by stoves and had no provision for change of air beyond the leakage of the doors and windows and the flow of air through the walls. It may be remarked in passing that a room heated by stoves will remain for a short time surprisingly pure in its condition, because of the rapid transfer of the lower strata to the upper by the currents induced by the hot surfaces of the stoves, but when the volume of the room becomes uniformly bad, as it quickly does, the condition cannot be described in terms of refinement.

No public buildings now are constructed without some recognition of the importance of ventilation, but, as a rule, the recognition is scarcely more than in appearance, providing, as they do, only partial outlets for foul air, with scarcely any opportunity for the inflow of pure air, the fact being seemingly constantly overlooked, that while the provisions for the passage of foul air are well enough in themselves, they are of little account without provision for the inflow of pure air.

It is true, windows and doors afford inlets for air, but as the choice between pneumonias and neuralgias and the evils of foul air are not worth discussing, all such sources of air supply are to be dismissed from a discussion of apparatus adapted to American winters.

Much difference of sentiment exists as to the proper temperature for rooms best promotive of the comfort and health of the occupants, and the ideas of different nations present curious phases.

Curtis tells us that the Chilians, with a climate similar to that of Washington, think that fires in a house are unhealthful, and wear their heavy wraps indoors as well as out, and although coal is cheap and wood abundant, sit in their houses with noses blue and teeth chattering, and at fashionable gatherings women appear in evening dress with the thermometer between 40° and 50°. He also states that the mortality from lung and throat complaints is reported to be immense.

The Englishman, too, sits in his large parlor with a small grate, and considers himself comfortable with the thermometer in the fifties.

The proper temperature for every individual is probably that at which he is most comfortable, and this will vary with the physical condition and manner of dressing; one who dresses very warmly needs but little for wraps, and will be oppressed with a temperature agreeable to one who makes more difference between indoor and outdoor wear.

As "comfortable" points, however, are not in use on the thermometer scales, we must express ourselves by the degrees marked upon them, and in practice an average amount of comfort may be secured in our latitude by about 65° for audience chambers, where the occupants sit with their wraps, 69° to 70° for schools, and 1° or 2° higher for parlors, with elderly people in the family.

Heating a building is generally attended to so far as providing against its being too cold, but the regulation of the temperature to provide against overheating and for the supply of a proper volume of pure air, are points which are very seldom secured.

Omitting for the moment the regulation of the temperature and considering the volume, and without citing all the authorities as to what constitutes a proper air supply *per capita*, it may be briefly stated that they vary from ten to sixty cubic feet per minute, the lower estimate, however, being based upon the theory of each one in an audience receiving at each inhalation a supply of pure air, and discharging it where

it cannot be again used, a condition only possible out of doors in a stiff breeze.

Sixty cubic feet of air *per capita*, per minute, for an audience, school-room, or class-room, with much more for the sick-room and the hospital, will, it is to be hoped, at an early day be acknowledged as the requirement for good ventilation, but in the present stage of education in these matters it is probably, as a matter of expediency, better not to state the scientific requirement, but, in order not to defeat the rising tide of healthful sentiment, name forty cubic feet per minute *per capita* as a satisfying quantity for the time.

Forty cubic feet *per capita* per minute means for a class-room with thirty, 1200 feet per minute ; for a parlor of fifty visitors, 2000 ; for a school-room of 100, 4000 ; for a lecture or court-room of 500, 20,000 ; and for an audience of 1000, 40,000 cubic feet ; and lastly, for the larger audience of 2500, 100,000 cubic feet of air per minute, as the requisite air supplies for a moderate estimate of the human needs when thus assembled.

How many of the buildings of the day are thus furnished with an air supply like this, or anywhere approximating it ?

Doubtless, these figures are startling to such as have not considered them, but they are not unreasonable, even if we have lived for many years with but one fourth or less of the supply, when we have been at lectures and elsewhere in large audiences and crowded rooms.

Suppose each of our heads were encased for a minute in an air-tight box less than three and one half feet dimension for each side, or forty cubic feet capacity, and had taken about a dozen full inspirations and expirations of our lungs, would we not deem it proper to have a fresh box at the expiration of that minute, especially if, instead of having the air-tight box exclusively for our own use, we were sharing our exhalations with a neighbor, and in turn were partaking of the exhalations of his lungs ?

An audience-room for 1000 seats on floor and galleries would be about sixty feet wide, eighty feet long, and twenty-five high, and contain 120,000 cubic feet, and the introduction of 40,000 cubic feet per minute would change the entire volume once in three minutes, or twenty times per hour, a change

which it is to be hoped the future will deem little enough, but is immensely in advance of the average present usage, which probably often does not change more than three or four times per hour, if even that frequently. For reasons which I cannot explain, unless it be that for the same percentage of vitiation, the unpleasant odor developed is less when the air is quickly changed than when it is slowly changed, I am inclined to the view that there will, for large, crowded rooms, be the same apparent sweetness, on a less inflow *per capita*, than in a smaller room with fewer in it. Thus in a class-room of thirty, with at least twenty feet *per capita* of inflow, the room has seemed more foul to me than a lecture-room crowded by an audience of 500 persons did with the same supply *per capita*, or 10,000 cubic feet per minute, and I am satisfied that a sitting-room with three or four occupants and closed doors will not remain pleasant short of sixty cubic feet per minute air supply, and that a class-room requires forty feet *per capita*, and that a larger audience will be equally comfortable with a little less ; but without explaining these differences, I would have the air supply whenever possible up to these requirements.

The degree of temperature and the volume of air per minute to be maintained having been fixed upon for our needs, further details remain to be considered.

There are probably but a few buildings in existence in this country in which, on continued occupancy by large assemblies, the temperature does not, in a short space of time, rise to an uncomfortable degree, even, it may be, so much as 20° in the course of an evening or single session, and be maintained at these points, although the closing of registers and radiator valves has discontinued the source of applied heat. Apart from the heat of the lamps and gas-lights, the main source of increased heat comes from the audience, each one of whom is a human stove of 98° temperature, radiating what with a few in a room is scarcely perceptible, but with many produces a great increase, and hence it is that while for the warming of a room in cold weather previous to its occupancy the incoming air must be at a comparatively high temperature, it must be greatly reduced after the human stoves have occupied the room and their wraps and outside clothing, cooled by the

weather before reaching the room, have become of the same temperature as the room.

As we are considering only the problems of cold weather, we dismiss as dangerous and barbarous the relief of overheated rooms by the opening of doors and windows to the outside air, and can allow of no arrangement but that which supplies the place of the outgoing impure air with that which is fresh and has been properly warmed.

Considering next the principles to govern the arrangements for the exit of foul air from occupied apartments, there has been more or less controversy as to whether ventilation should be from top or bottom, with the probably now well-accepted result that both are correct, according to circumstances.

In a room with few occupants, the greater part of the air exhaled from the lungs cools and falls to the floor, being also increased in specific gravity by the impurities added to it in the process of breathing, and hence for sitting-rooms and chambers, the floor line (not the line above the washboard, as mechanics often insist and too many architects allow) is the proper level for the foul air outlets.

Doubts have been expressed by well-informed men as to the necessity and importance of floor ventilation ; but besides the obvious advantage of drawing off the layer of cool air apt to rest upon the floor level, the experiments of the late John M. Whitall, some years ago in the sick wards of the Philadelphia Hospital, by which he found that as he lowered the outlet for foul air by successive steps until he placed them at the floor line, he lowered the sick rate of the ward, demonstrates too conclusively to admit of cavilling the importance of floor-line ventilation for rooms of small occupancy.

It is true, a portion of the lung exhalations are volatile, and to be found at the top of the room, and for these and the heated gases from lamps and gas-lights a small outlet at the ceiling would be correct ; but as open registers at the ceiling would on ordinary occasions be but an outlet for pure air, and a waste of fuel in consequence, it is safe to dispense with them in ordinary sitting-rooms and chambers and trust to the dilution of the upper strata by the warm air rising from the registers to the ceiling and thence falling to the floor and passing out at the floor-line vents.

For parlors, however, where large companies are to be occasionally entertained, it is better to provide ample ceiling ventilation for reasons presently stated, but to be careful to keep them closed ordinarily.

The volatile exhalations which are found at the top of the room become more worthy of attention as the occupancy increases in numbers, and they become perceptible "odor" to visitors from the fresh air, and the question arises, Which is the lesser evil, to provide for their removal at the risk of wasting pure air and fuel and destroying the floor ventilation, or to endure the slight odor, which, if the air supply is at all reasonable, is not serious in itself?

With the usual risks of unskilful handling of registers by careless or indifferent attendants, it is probably better to dispense with the ceiling ventilation, but with skilful and interested care-takers, it would probably be as well in class-rooms and similar rooms to have ceiling registers, with rigid rules for closing them when the rooms are not occupied, taking care also that the ceiling outlets shall at best not exceed in area one fourth of that at the floor line.

In large and crowded rooms, like lecture and court-rooms and meeting-rooms, the problem again changes. In these cases the air supply will or should be much below that of the temperature of the human stoves, and from these human stoves are continually ascending currents of heated air, carrying with them the exhalations of the lungs, and for such rooms, when sufficient inflow of air is supplied, the ventilation may safely be at the ceiling; providing, however, a trifling outlet at the floor for circulation purposes when warming the room previous to occupancy, at which time the ceiling outlets should be closed.

Allusion may here be made in passing, to what has doubtless surprised many who have attempted to relieve rooms which were originally constructed devoid of ventilation facilities, by adding ventilation at the top or by the pulling down of windows. They have reasoned that if a room was overheated, the hot air at the top would escape if opportunity was offered, and they reasoned correctly to that extent, but they overlooked the fact that for all the air that escaped there must be an equal volume to take its place; and hence in the room

described, the supply would come in just where it went out, or rather a stream of hot air would go out one portion of the opening and a stream of cold air pass in the other part. As air does not heat quickly from itself, a chilling body of cold air, whether from ventilator or window top, falls upon an audience, and as they are previously overheated, the sudden blast is a source of danger to them, and the last state of the audience is worse than before.

An old-fashioned meeting-house in Philadelphia, constructed in the beginning of the century, without ventilator appliances, was altered some thirty or more years ago by the addition of central ventilators in the ceiling, opening with cupola and slat-work through the roof, but they were unavailable in cold weather for reasons above mentioned.

A year or more ago, I tried the experiment of covering one of the ceiling openings with a sheet of metal perforated with small holes not exceeding one fourth of an inch in diameter, knowing that although the cold air must come through some of the apertures as the heated air passed through other apertures, yet I had a hope that as the incoming currents were finely divided streams, they would, in passing toward the floor, twenty-five feet distant, become so nearly the temperature of the room as to become harmless as to temperature. I was, however, disappointed and the device proved useless ; it might have worked if the heated air had gone out at alternate apertures with those at which the cool air came in, but the probabilities are that the outgoing currents massed at one half the plate and the incoming at the other, and the latter joining together as they fell, made the operation of the ventilator about the same as if no perforated plate had been used. Very likely, if I had carried alternate tubes to within eight or ten feet of the floor, with the hot-air apertures between the pipes, there might have been better success in the result.

I was lately shown another plan for relieving an oppressive lecture-room of heated air and supplying it with fresh air, but it, too, was a failure, and I consider all attempts at ventilation and air supply as misspent means and labor, unless they comprise ample facilities for warming or tempering the inflowing air when the weather is cold.

Coming now to the consideration of the methods of heating

rooms and buildings, the use of stoves and direct radiators placed in rooms must be discarded, because of their furnishing no air supply to the rooms. Some advantages have been supposed to arise from radiated heat, because affording sensible warmth and admitting of cooler air for breathing, but less stress is now laid upon this than formerly, and it is of no practical account for large audiences.

Openings are sometimes made adjacent to the ordinary direct steam radiators in rooms, but their action is uncertain, as, at times when the wind is unfavorable, the air will pass out through the openings instead of into the rooms, and when the weather is very cold and the wind favorable for the air supply, the portion of steam surface presented to the current of air is inadequate for its warming, and the aperture is closed because the room cannot be kept warm enough on account of the cold current.

Hot-air furnaces are an advance upon stoves, because all the heating done by them is accompanied by a volume of air of greater or less amount, and for years to come, for many private and some public buildings of moderate size, hot-air furnaces will probably be used, and within reasonable limits may answer a fairly satisfactory purpose.

The besetting shortcoming of the day, however, is that the furnaces for buildings, whether private or public, are altogether inadequate in capacity for the work that ought to be done, and the air supply to the furnace and the flues for conducting the air to the rooms are seldom half the size they should be. The consequence is that many buildings cannot be warmed in zero weather by their furnaces, the air supply is never sufficient for the occupants, and as the furnaces are often necessarily forced and without water evaporation, the air is supplied at a high temperature, and the floating particles in the air being burned upon the overheated surfaces, the quality of the air furnished to the living rooms is baked, unpleasant, and unwholesome. It will be urged that larger furnaces will cost more to erect and run, which is true as to first cost, but, within certain limits, not true as to maintenance, because it is quite as expensive to run a small furnace beyond its capacity as it is to run a furnace better proportioned to the work.

In building flues for inflow and outflow, it is not well to build smaller than twelve inches square because of friction, the total area, I think, should equal one third of a square foot for every 1000 cubic feet of contents. This will bring controversies between owners and builders ; but I have a hope, future owners and builders will be willing to plan their flues first and adapt the balance of the house to them. In large buildings flues eighteen inches square are a good size.

With furnaces or any other method of heating, there should be provision for changing the temperature of separate apartments, without such regulation of the furnace as inconveniences other parts of the house, or the closing of registers and restricting the air supply. This has seldom been attempted. Two cases of private houses are within my knowledge, in which the air was taken at will from the top of the furnace or from the bottom, but the mechanical work was at fault in one case and the flues too small in the other to be wholly successful ; but these are matters which experience can quickly cure.

In the case of lecture or other rooms of sufficient size to require one or more furnaces for their especial warming, a simple device will greatly relieve the overheating. This I accomplished for a meeting-house in Philadelphia by having large openings made in the furnace chambers above the drums and causing the doors to these openings to be worked by the Johnson heating regulating apparatus, which at the same time worked the draught of the furnaces.

Thermostats placed in the meeting-room, being set at a given point, the operation is that when the temperature of the room rises above this point, the draughts of the furnaces are closed, thus reducing the fire, and air is admitted to the furnaces above the drums and passes up into the room only partially heated until the temperature falls to the regulation point, when the cool-air opening is then closed, the air follows the usual course through the heating chamber and the draught is put on the fire.

The foul-air ventilation is at the ceiling, and the apparatus works very well for an appliance made to an ordinary furnace ; and all lecture-rooms, heated in the usual way by furnaces, could be greatly improved in this way at a moderate expense, although no furnaces of the old patterns are probably of suffi-

cient capacity and air supply to meet the proper demands of an audience.

The best furnaces for capacity and the best arrangement of heating and ventilating by hot-air furnaces that have as yet come to my knowledge, are the Rutan hot-air furnaces and the Rutan arrangement of flues, furnished and planned by Smead, Wills & Co.

These furnaces are so arranged that the cold air passes at will under the furnace or through it, or partially in each way, and the sizes of the flues are in accordance with a suitable provision for the ventilation of the building.

With the ordinary steam apparatus, indirect heating or placing the radiators at the base of flues is relied on for the purpose of warming the air before it enters the room, and the flow of air through the flues is relied on for the air supply. The current is thus dependent somewhat upon the amount of steam supply to the radiators, and somewhat upon the suction or pull of the foul air or ventilating flues of the building.

This indirect system answers partially well for dwellings and rooms of but few occupants, but is totally inadequate for the wants of class-rooms and rooms of many occupants, as the diminished temperature required when the rooms are full curtails the ascending force where the most air is wanted, and moreover, as the outside temperature approaches the inside requirements, all the systems of natural draughts depending upon the difference in weight of the outside and inside columns of air completely fail of their desired efficiency.

Without dwelling at greater length in illustrating these points, because they are probably obvious to all who of later years have examined the subject and have had experience in contending with the practical solution of heating and ventilating problems, I think it may safely be stated that the time has come for, and the state of sanitary engineering education warrants, the abandoning of all reliance upon natural draughts in the ventilation and air supply of all large buildings or rooms of crowded occupancy of whatever character, private or public, with perhaps occasional exceptions of single rooms opening directly at the top.

This point being reached, there remains only the consideration of its alternative, or forced ventilation.

Forced ventilation may be secured by artificially heating the exhaust flues or shafts, or by exhaust fans, either of which plans will withdraw the foul air from the respective rooms, and thus induce an inflow of pure air to the rooms at the inlet. In some cases, perhaps, this is the most convenient method that can be adopted.

A minus condition to a room, however, will induce currents from all openings, as well as those intended for the air supply; but the leakage from windows and doors of cold air, as well as the quickening of the currents of air cooled by direct contact with the windows and walls, are undesirable.

The minus condition may also, in many cases where the inlets and outlets of the rooms cannot be placed advantageously, result in a direct passage of the pure air to the outlets without distribution through the room, thus making thoroughfares of wholesome atmosphere, but leaving great masses of stagnant air between them.

Ventilation shafts, if of much size and of a height to be effective, are expensive, and the cost of maintaining the upward current by applied heat is not economical, for the experts tell us that one pound of coal will accomplish twice the work in moving air when expended as power that it will accomplish when expended as heat; and, further, the construction of exhaust shafts is often incompatible with the convenient arrangement for large buildings, excepting by increasing the number of them and largely adding to the cost of construction.

On the other hand, a plenum condition of a room, or that resulting from having the fresh air forced into the rooms, obviates some of the disadvantages of the minus or exhaust system, for the pressure being upon all parts of the room, the cold air is pressed against at all the cracks or leaking places of doors, windows, or elsewhere, instead of being encouraged to enter; and, again, an open door from either out-of-doors or a cooler hall or room, is not the means of having rude blasts of shivering air enter the room, disagreeable and dangerous to the inmates. For hospitals and other places, where it is desirable that even small portions of air from a room should not be allowed to pass into other parts of the building, it may be needful to assist the exhaust flues of the rooms by artificial means; but for all ordinary buildings, such as school-houses,

lecture-rooms, etc., when properly arranged with vent for each of the rooms, the plenum system will, without doubt, be sufficient and most desirable.

Fans have long been used for producing forced ventilation in buildings and keeping the rooms in the plenum condition, and if properly constructed and proportioned to the work, and properly supplemented with suitable air conduits, are the best means of accomplishing the object in view.

In many large buildings it has been the practice to use a simple wheel of large diameter, with curved flanges or vanes at the circumference displacing large volumes of air, and driving the same into basement corridors or ducts, from which the air passes through the radiators at the base of flues leading to the various rooms of the building.

As a rule, the current of air from wheels of this character forcing the air into large corridors becomes of very little effect at a comparatively short distance from the wheel, partly from the construction of the wheel not being the best for exerting pressure upon the current, partly from the leakage of the duct or corridor, and partly because from the size of the corridor any pressure from outside winds upon exposed apartments would be sufficient to drive back the currents and prevent them from entering the rooms, by cushioning upon the air in the corridor or the supplying duct.

Practically, therefore, the fans thus constructed and arranged are of little value, and in one instance of a large institution within my knowledge, the superintendent ceased to use the fan, and made openings at intervals into the corridor for an air supply, thus returning to the ordinary indirect heating system depending only upon natural draughts. Buildings arranged in this manner would be very much improved by constructing a by-pass or valve work at the base of each flue, by which the air could at will be made to pass through the radiators or around them for the controlling of the temperature in the rooms above, or if a simple regulating apparatus was provided by which the steam supply to the radiators governed the temperature.

The most effective apparatus that has yet been devised for heating and ventilating large buildings of which I have any knowledge, is by the use of an ordinary pressure blower at-

tached to a heating chamber through which it forces the air, and from which the heated air is conducted in air-tight piping of proper proportions, branching off to the various rooms in the building.

For the heating surfaces of the heating chamber the usual steam pipes and coils will answer, but the heating chamber which much more favorably impresses me is one recommended to me by George W. Storer, of 149 North Third Street, Philadelphia, to whom I am indebted for having first called my attention to the efficiency and economy of applying to schools and public buildings the system I am now attempting to describe and recommend--a system which, it is to be observed, has been generally adopted of late years for warming large industrial establishments, but without the detail needful for use where the buildings are divided into many apartments.

The heater built and used by G. W. Storer consists of two tiers of the ordinary pin radiators, through which the air to be warmed is forced by the blower.

There is an advantage in banking the heating surfaces of a building in one mass, as it puts the control of the steam upon a single valve, if desired, rather than upon a multitude distributed all over the building; for although this does not relieve from care of blast gates and registers at the respective rooms, the care of management of the latter and the cost of repair are much less than for steam valves.

I am also disposed to believe that the loss of heat in carrying the heat to a distance is less than by a ramification of steam pipes all over the building, notwithstanding the superior carrying power of steam, but I apprehend there has not sufficient experience been had to determine this point with certainty.

Less radiating surface for the cubic contents of the building is required when the radiators are concentrated in a chamber arranged as just described than when they are distributed around at the different rooms, and the mains and returns are dispensed with, and the cost of steam fitting much reduced. The total cost of the heating plant of a building by this method, notwithstanding the expense of blower engine and piping for the hot-air ducts, is but little if any more than a plant of the ordinary type of indirect steam heating.

The reason that less heating surface is required for the same work is because a radiator filled with steam under ordinary arrangement can only affect the temperature of the quantity of air which comes in contact with it, but is capable of heating a much larger volume than comes to it when influenced only by natural draughts.

An illustration of the capacities of these pin radiator heaters may be mentioned in the results of experiments in 1887 with a small model in which each tier consisted of three pin radiators, or six in all, the air being forced with a small blower of six-inch outlet.

When the air was forced through the heater under a pressure of four and one half inches of water, or say with a velocity of over 7000 feet per minute, the temperature of air was raised from 20° to 163°, or 143° ; and with the air pressure of two inches of water, or over 5000 feet per minute, the temperature was raised to 180°, or 160°. High-pressure steam, or forty pounds to the square inch, was used in both these experiments.

With ten pounds of steam on the heater, and air pressure two inches of water, the temperature of the air delivered was 147°, or 127° of elevation of temperature.

A model of this size is not to be altogether depended upon for calculations of a large plant, but the great heating capacity of the heater properly proportioned cannot fail to be apparent, as also the fact that if two tiers of pin radiators are kept filled with steam it will be impossible for air to get past the radiators at any velocity for convenient use for heating purposes, without being sufficiently warmed.

In a larger heater containing sixteen radiators in each tier, I purposely covered one half the radiators as well as could conveniently be done in order to test certain points respecting the retardation by friction, thus exposing only eight radiators in each tier to the air supply of sixteen inches in diameter.

With so small a radiating surface and so large a pipe, the temperature was raised 118° with an air pressure of one and one half inches of water, or a velocity of over 4000 feet per minute ; and 130° with one half an inch pressure, or velocity of (say) 2500 feet per minute, or a delivery of (say) 3000 cubic feet per minute—the outlets not being quite equal in area to

the sixteen-inch opening. This experiment must not be taken for a basis of close calculations, because the radiators which were covered over were filled with steam at the same time, and probably contributed something to the temperature, although little or no air passed through them.

Making all allowances, however, and counting the heating surface of the pin radiator at practically eight to eight and one half square feet, though nominally greater, the heating power is very apparent.

In another series of experiments with the heating apparatus, in which the full capacity, however, was not tested, the water of condensation was weighed.

The aggregate experiments extended over an hour and three-quarters, the temperature was raised 100° on an average, the quantity of air passed through the heater was 472,508 feet, and the condensation was 558½ pounds of water—or reducing this to an hour, the volume of air was 270,000 cubic feet and 319 pounds of water.

Allowing the very low estimate of six pounds of water to one of coal, we have fifty-three pounds of coal as the equivalent of work, or in other words, one half pound of coal per hour raised 2700 cubic feet of air 100° in temperature. This is a very fine showing, and six pounds is a very small allowance for the evaporation power of the coal, but there must be a liberal counting on radiation of heat at the boiler before the steam reaches the heating chamber.

Heavy pressures of air are not desirable for ordinary purposes of heating and ventilation, both on account of the strong currents to be handled at the rooms and the apparent loss of heat at the point of delivery from expansion into the room. This, perhaps, is not serious, but care must be taken to have ample capacity of blower and engine for maintaining an air supply in time of storms, when the pressure on exposed sides of a building tends to neutralize the air supply for that part of a building. This difficulty is well known in ordinary methods of heating, and it is owing to the inability of the old-fashioned wheel fans heretofore described, and the modern radial fans known as the wing-fan pattern, to maintain a pressure upon a building, that pressure blowers, such as are constructed for heating and ventilation purposes, are to be preferred, and in

fact they are, I think, the only kind of sufficient reliability to be recommended.

Heating plants have long been designed and used essentially upon the plan here recommended, but have not been entirely successful, probably solely through the want of liberality in their proportions, but these are defects which observation will make apparent. It will also require time to bring the system into favor, as it will probably be condemned—as it has been by those, who, upon greater knowledge of its merits, have adopted it.

Future experience will, no doubt, greatly perfect the details ; but enough is already known to warrant the venturing upon suggestions.

I recommend taking a uniform pressure of one quarter of an ounce as the force of the air supply in the main piping, and having the blower capacity per minute at that pressure equal to one tenth the cubical contents of the building to be heated and ventilated.

In other words, for a building of 500,000 cubic feet contents, the blower should deliver 50,000 feet per minute when running at a speed equivalent to one quarter ounce pressure, and taking for the equivalent velocity of the air 2000 feet per minute at the points of exit as the basis of all calculations for the delivery of volume instead of the theoretical velocity of 2584 feet.

The blower should not be calculated upon this basis at its maximum capacity, but should be capable of being driven at a velocity increasing the air supply to an ounce or more pressure if required.

The basis herein recommended indicates a capacity to change the air in the whole building every ten minutes on a normal speed, which, while not covering all that may be wanted in special rooms, is so far in advance of the prevailing usage as to answer for a beginning at this stage of the science, especially as the surplus power can be held as a reserve.

In practice, the whole of a building is seldom used at once, so that the full capacity will seldom be invoked, and the rooms not in use will, of course, not be drawing upon the air and warmth supply, and hence special rooms may be changed once in five or three minutes if so arranged.

It is a property of air currents from a blower that the closing off of part of the outlets does not clog the blower, as it really runs the easier, the wheel in the case simply slipping in its own air supply ; and as the exhaust steam of the engine is utilized in the heating chamber, the cost of producing the currents and pressure upon the building is very slight.

Great care is needed in the piping for this system, as the engineers and architects accustomed to planning and the mechanics skilled in the workmanship are at present very few ; the tendency of the former being to pipe on too small a scale, and the latter to be abrupt in their angles and rough in their work.

As the details must vary with every building, only general principles can be enunciated, and these may require modification in special cases, but the following may be of service as a guide :

The blower being of the capacity indicated, the main pipes leading from it must maintain the full cross-section of the area of the outlet of the blower, until the diverging branches to the various rooms of the building have reduced the demand upon the main, when the main may be reduced in section, care being taken not to reduce too rapidly ; small branch pipes of great length are quite undesirable ; it is better to so divide the mains as to keep as great a mass of the heated air together as circumstances will allow.

The number of branch pipes to each room will depend on the size and circumstances of the room. One pipe, of eleven inches diameter, discharging at one fourth ounce pressure would deliver over 1300 cubic feet per minute, but two pipes of eight inches each would deliver about the same, and by being at different points in the room, secure a better distribution. Unless for small rooms or closets, less than six-inch outlets are not desirable.

The area of the branch pipe or pipes to a room must not be less than one square foot for every 20,000 cubic feet capacity of the room, for changing the air once in ten minutes, and of course must be greater for crowded rooms.

As a rule, the blast pipes should not enter directly into the room, but should open into flues or pipes at the rooms of four times their area, in order to reduce the velocity of the inflow

at the room. This refers more particularly to registers or inlets at the sides of the rooms, eight feet from the floor, as with this arrangement I have had no inconvenience whatever from currents, although the smaller pipe within the flue delivered air at the quarter ounce pressure, or 2000 feet per minute velocity.

Where this enlarged flue cannot be had for expanding the current, it may, however, do to run some risks of currents. Thus, in a certain lecture-room not originally constructed for this system, I have, through the flues, as I found them, driven three overhead streams of air, delivering not less than 10,000 feet per minute, at a velocity of 2500 feet per minute, the currents reaching to the opposite wall, fifty feet distant, with but a moderate annoyance from currents in the room; and this annoyance a little change of delivery places will probably remedy.

Round pipes are better than square pipes, a circular pipe one foot diameter delivering air more satisfactorily than a pipe one foot square, with the saving both in mechanical construction and in the material proportional to the relative circumference, or nearly twenty-five per cent.

Corners must always be turned on a perfect curve. I have seen the delivery of pipes almost destroyed by an abrupt turn, although the outlet area was maintained. It follows also that branches must always diverge from mains at an acute angle, and never at 90°, to insure full delivery.

For large audience rooms liable to be closely packed, the best method of entering the fresh air is through the floor by small orifices, so numerous and of such area that a steady flow passes steadily upward, without serious draught, to the outlets at the roof or ceiling.

Many audience chambers, however, cannot have the use of the basement or room beneath for the necessary piping or reservoir of air, and in that case, recourse must be had to the sides of the room and the outlets above the heads of the occupants eight or ten feet from the floor, as may seem best, according to the height of the room.

As all machinery is liable to accident, the heating chamber and blower should be duplicated in cases where a delay in heating would be inconvenient. Thus for a building of 1,000,-

000 cubic feet capacity, instead of one large wheel of 100,000 cubic feet per minute capacity, two of 50,000, with their respective heating chambers, would be better, placing them contiguous to each other, and arranging so that one could do the work of the other when temporarily necessary. This could readily be done by speeding up above the regular speed, and being satisfied for the time with a little less air supply as a whole.

The fan and heater and piping constitute the main portions of the plant, but other details are of great importance for controlling the temperature of the rooms to be heated without varying the air supply.

In the case of large audience rooms, the simplest plan would be to let one blower ordinarily be in service only for that room, and regulate the temperature by the steam valve of the heating chamber, either with automatic apparatus controlled by a thermostat in the chamber, or, if an apparatus is used which will indicate the temperature of the chamber in the engine-room, the hand of the engineer can, without much care, keep a steady temperature.

This, however, will not be available where several or many rooms are to be heated by the air from the same main pipe.

To meet this case in a building where the basement was not required for other purposes, I devised a simple application of the principle of induction.

In this building the main warm-air pipe starts from the heating chamber with a diameter of fifty-four inches and passes through the central corridor of the basement, branching out to flues on either side and diminishing in diameter to about eighteen inches at the extreme end.

The branch pipes of six, eight, and more and less inches enter the flues for the rooms and terminate in the base of these flues with a short pipe above the elbow, the hot-air pipe being furnished with a blast gate worked by a lever in the class-room. The flue is about four times the area of the blast pipe, and at the base on the other side of the corridor hall has a valve door, which, when open, admits air from the basement around the blast pipe.

The cool-air valve is also worked by a lever in the class-

room, and the flue opens into the class-room eight feet from the floor.

The air in the main pipe is intended to be kept at a steady pressure of one quarter of an ounce and at a temperature according to the weather to afford sufficient heat in any part of the building.

With the blast gates wide open, a flow of warm air enters the room in a volume sufficient to change the volume of the room once in ten minutes, but when the room becomes heated to whatever degree is desired, say 68° or 70°, the hot-air pipe is slightly closed and the cool-air valve is opened.

By this operation the warm air is slightly curtailed, but, as it is still rushing in with considerable force and is surrounded with cooler air from the opening of the cool-air valve at the base of the larger flue, by the principle of the injector or by induction, it carries up a greater volume than has been shut off from the warm air pipe.

It requires but little care to so adjust the valves as to vary the temperature at will, without diminishing the volume.

This plan, however, would not be available in buildings in which the basement was wanted for occupancy, or where, owing to surrounding buildings or for other reasons, it was not easy to obtain the supply of cool or tempered air at every flue.

These contingencies can be met by doubling the piping system, carrying hot air through one system and tempered air through the other, and entering the branches from both into the flue or directly into the rooms and regulating the inflow by suitable valves.

In this arrangement the heating chambers must be arranged to supply the air at the respective temperatures required.

Flues are the better for being in inside walls, rather than outside, and no fears of good distribution need be entertained, because both inlets and outlets are on the same side of the room.

Where the walls do not admit of good-sized flues, offsets in the room should be endured rather than small flues.

Offsets may be reduced to a minimum by using metal.

Registers should be dispensed with when the inflow is regulated by other valves, and an opening with a neat border and lining will soon be as sightly to the practical eye as registers.

Fans should be run by their own engines, in order that the air delivery may be controlled according to the occupancy of the building, without reference to connections with other machinery.

Moisture should be added to the air after warming. In one case where I failed of sufficient quantity with a large surface of boiling water, I found a steam-jet to answer.

Specially exposed rooms must be borne in mind and specially provided for. Thus in an institution, the newest part of which is warmed on the system described, the temperature was not satisfactory for three rooms very much exposed, the pipes to which were small and carried in outside walls, but all defects were cured by an increase of the air supply.

In conclusion, the object of this is more for the purpose of inciting investigation and much-needed improvements in the ventilation of public buildings, and places where audiences gather and business men spend their time in business hours, than to present a basis for technical contention.

The methods particularly recommended may not be applicable to all existing buildings, though there are but few buildings in and near Philadelphia, however recent their erection, but that greatly need improvements in ventilation. With those who cannot suspend their judgment long enough to understand what is being explained to them without expressing either an adverse opinion or a description of some other system, it is a thankless task to discourse, but those who have worked sufficiently in the practical work of heating and ventilation to realize the real intricacies of the problems presented, and which vary with every building, everything bearing upon the subject is patiently considered, and with an interest that pertains to seekers for further knowledge.

At the end of ten years, after taking an interest in matters pertaining to ventilation, I felt I was further back than at the beginning, and at the end of twenty years had made but little progress. At the present time, some ten years later, I am only at the point of starting afresh, hoping, however, to give some impetus to the cause, and particularly to incite others to go on to more perfect work.—*Journal of the Franklin Institute, August,* 1889.

THE PHYSIOLOGICAL CONDITION AND SANITARY REQUIREMENTS OF SCHOOL-LIFE AND SCHOOL-HOUSES.*

By A. N. BELL, A.M., M.D., Brooklyn, N. Y.

"*Experto Crede.*"

IT is the characteristic of every living organism in its progress to maturity to build itself up according to a certain inherent type or pattern, subject to modification, however, under the influence of external conditions; and particularly so during the early period of existence, when the processes of development and growth are most active. During this period the organism is plastic and readily yields to the modifying influence of external conditions, insomuch that the constitution of the individual adapts itself to them, more or less, and not unfrequently becomes fixed for the lifetime. So that, if a young person of originally healthy constitution be subjected for a considerable period to such injurious physical conditions as tend to produce a modification of type, the effect is to cause a constitutional weakness or diseased state, not only during the lifetime of the individual, but it may be to establish a diathesis with hereditary tendencies. Because when the modification of the type is once fixed in the growing brain, or the constitutional tendency to disease is once established, it becomes a part of the general fabric. The different organic functions adapt themselves to the change and the constitution is maintained by nutritive substitution. For, as well remarked by Herbert Spencer:

* MERRITT H. CASH-PRIZE ESSAY, Medical Society of the State of New York, 1887. By vote of the Society, 1500 copies of this Essay were printed for distribution to the school officers of the State. But besides these the author of the Essay has had so many applications for copies that he has concluded, by permission of the Society, to republish it in these pages.

"Nature is a strict accountant; and if you demand of her in one direction more than she is prepared to lay out, she balances the account by making the deduction elsewhere. If you will let her follow her own course, taking care to supply in right qualities and kinds the raw materials of bodily and mental growth required at each age, she will eventually produce an individual more or less evenly developed. If, however, you insist on premature or undue growth of any one part, she will, with more or less protest, concede the point; but that she may do your extra work, she must leave some of her more important work undone. Let it never be forgotten that the amount of energy which the body at any moment possesses is limited; and that being limited, it is impossible to get from it more than a fixed quantity of results. In a child or youth the demands upon the vital energy are various and urgent. The waste consequent on the day's bodily exercise has to be repaired; the wear of brain entailed by the day's study has to be made good; a certain additional growth of body has to be provided for; and also a certain additional growth of brain; add to which the amount of energy absorbed in the digestion of the large quantity of food required for meeting these many demands." *

But constitutional vices contracted under unfavorable circumstances during the period of growth, may, by a change to more salutary conditions, be gradually overcome, and by a continued subjection to healthy surroundings the normal type of the individual regained. This, however, can be effected only during the early period of life, when the modifying influence of external conditions is the most potential, and when the formative capacity of the organism is most active in turning to account all the food and force it derives from without —"like the architect who *directs* the construction of an edifice, which is raised out of the *materials* brought together by one set of workmen, by means of the *labor* furnished by another." †

The constant physiological and chemical changes which accompany life depend upon the various reciprocities which are

* "Education: Intellectual, Moral, and Physical," p. 269.

† "Principles of Mental Physiology." William B. Carpenter, M.D., LL.D., etc., p. 337.

produced by the work of the different parts of the body—the assimilation of what is received and the elimination of what is useless, and the restoration of the organs by which these operations are effected.

NUTRITION.

All the phenomena of maintaining a living existence are accomplished by the process of nutrition and the unceasing elimination of the redundancy of food substances and the waste of the materials of which the body is composed. Every act of volition, every exertion of muscular power, every functional action of the organism, whether perceptible or imperceptible and involuntary; every by-play of chemical affinity and decomposition, even thought itself, occasions the disorganization and destruction, as living matter, of a portion of ourselves. And by this process it is that the various parts of the organism are restored and maintained in the same general condition of form, size, and composition which they have already attained by development and growth.

Development is the process by which each tissue and organ of a living body is first formed, or by which such tissue or organ being already incompletely formed is so changed in shape and texture as to be fitted for a function of a higher kind, and is finally advanced to the state in which it exists in the most perfect condition of the species to which it belongs.

Growth, on the other hand, consists in the increase of the organism by the addition of materials similar to those of which it is already composed. By growth bodies increase in weight and size, and if they acquire more power, as they commonly do, it is only power of the same kind as that which they before possessed, the composition is the same. Although distinct from each other in so far as the one relates to the formulation of and improvement in texture, and the other to enlargement, development and growth are intimately associated, and for a time contemporaneous in their operations; while they greatly differ from each other in their proportions according to the conditions under which they are fostered, and to this extent there is an antagonism between them—excessive activity in either one involves the retardation or arrest in the progress of the other. Both depend upon nutrition, and it is

by this process that an adult person in health maintains for a considerable period the same general outline of features and nearly the same size and weight, although during all this time the several tissues of the body are undergoing perpetual dissolution and renovation. [It is evident, therefore, that at every period of life income must equal the expenditure in order to maintain the same general condition of the form, size, and composition of the various parts of the body which they have already attained by development and growth. But while these processes are still in progress, more is required ; allowance must be made during the period of growth for building up as well as sustaining purposes ; hence it is that children and youth require more food in proportion than adults, and that persons who lead sedentary lives and the aged require less than the active and vigorous.] The continuous absorption of oxygen and the excretion of carbonic acid—the blood being the medium by which these gases are carried and exchanged —are essential at every moment of living existence. These two processes, the absorption of oxygen and the excretion of carbonic acid, are complementary, and their sum is

RESPIRATION.

Respiration and the various important changes with which it is connected constantly tend to repair the substance of the bodily tissues. This process it is that begins with life and ends in death, which, in co-operation with the circulation of the blood, both supplies and depurates all the vital elements.

Although the atmospheric air and the blood are not brought into absolute contact by the process of respiration, there is no impediment to their mutual action. All the membranes and tissues of the human body possess the property of absorption, and the breathing membrane, which separates the blood from absolute contact with the air in the lungs, in particular, is adapted to this property with the most wonderful facility.

The *trachea* or wind-pipe (see figure of the Heart and Lungs) divides at the bottom of the throat into two branches or bronchial tubes, one to each lung, and these, severally, subdivide, again and again, throughout each lung respectively, until they are finally lost in the air-cells. The breathing membrane which lines and dips down between the air-cells is attenuated

to the greatest possible degree of thinness, finer than the finest cobweb, yet it is apparently wholly composed of *capillaries* of infinitesimal smallness, and through these all the blood of the body passes three times every minute.

The total number of air-cells in the lungs of the human body has been estimated to be *one thousand seven hundred millions*, and the actual surface they present to the inhaled air and the diffused blood in the capillaries, as recently estimated by M. See (*Bulletin de l'Acad. de Med.*), is about fifty-four times that of the cutaneous surface of the body, or eighty square meters. [861 square feet.]

In every 100 volumes of atmospheric air, there is an average of 79.2 volumes of nitrogen and 20.8 volumes of oxygen ; and in every 10,000 volumes of this mixture, about four volumes of carbonic acid. Watery vapor also exists in the atmosphere in variable quantity, depending upon the temperature. But under the same temperature and under the same pressure, the maximum quantity of watery vapor capable of being mixed with the air is invariable. It is rarely less than one two-hundredth part, or more than one sixtieth, and gives a mean average of 0.84. The normal atmosphere also contains a trace of ammonia.

The capacity of the lungs of an adult has been variously estimated at from 200 to 300 cubic inches, and the amount of air drawn into the lungs and expired therefrom, at each respiratory act, at 200 and 175 cubic inches, respectively. The lungs after once being inflated by the first breath are never thereafter wholly empty of air during life ; from 100 to 125 cubic inches of air constantly remain, residuary, transferring its oxygen *into* the blood and receiving carbonic acid and other effete products *from* the blood. About a half a cubic inch of air is absorbed at every inspiration, and this is wholly oxygen, and is replaced by a relative proportion of carbonic acid exhaled through the same membrane that the oxygen is inhaled. These quantities, however, greatly vary according to circumstances and conditions—of temperature, air respired, food and drink, exercise and sleep, etc. But the amount of carbonic acid exhaled always bears some kind of proportion to the work done in the day. After a laborious day, the exhalation of carbonic acid is proportionately active. It is acceler-

ated by all occupations belonging to the day, and increased after taking food. It is also exhaled in larger proportion during cold weather than in warm, and more when the air is moist than when it is dry.

But its most important relation appears to be in regard to the age and weight of individuals, and to the functional activity of children.

In several series of tabulated experiments of carbonic acid exhaled under various conditions by different observers, as published in Simon's "Chemistry of Man" (p. 112 *et seq.*), the following by Sharling are selected, as being specially pertinent to the subject under consideration: 1, a male, at 35, weighing 131 pounds; 2, a male, at 16, weighing 115½ pounds; 3, a soldier, at 28, weighing 164 pounds; 4, a girl, at 19, weighing 111½ pounds; 5, a boy, at 9¾, weighing 44 pounds; 6, a girl, at 10, weighing 46 pounds. The carbon exhaled per hour amounted to:

No. of the Person.	Amount of Carbon.	Remarks.
1.	145 grains.	Fasting.
In June,	190 "	After breakfast and a walk.
when very	130 "	Hungry.
hot.	165 "	Two hours after dinner.
	160 "	After tea.
	100 "	While asleep.
2.		
In June,	114 "	Sleepy.
when very	144.2 "	Fasting.
hot.	139.8 "	Fasting and hungry.
	177 "	Half an hour after breakfast.
	167.7 "	Two and a half hours after breakfast.
	180.8 "	Two hours after dinner.
3.		
In October.	137.8 "	Asleep.
	111.9 "	Fasting.
	159.4 "	Fasting, after breakfast and work.
	188.9 "	After dinner.
	194.7 "	Three hours after dinner.
	178.3 "	After work.
	122.3 "	While asleep.
4.		
In October.	98.9 "	While eating.
	91.3 "	Fasting.
	92.6 "	After supper.
	133.8 "	One hour after breakfast.

5.		
In Autumn.	76.2 grains.	Fasting.
	91.8 "	While at breakfast.
	113.8 "	After breakfast.
	119.3 "	One hour after dinner.
	84.5 "	Two hours after dinner.
	74.8 "	While sleepy.
	117.0 "	One hour after dinner.
	108.9 "	While eating.
6.		
In Autumn.	65.5 "	While asleep.
	95.3 "	After breakfast.
	103.0 "	After dinner.
	99.0 "	Shortly after tea.
	75.1 "	While asleep.

Supposing that adults sleep seven, and children nine hours per day, the amount of carbon consumed is on an average:

In Twenty-four Hours.	In One Hour.
1. 3380 grains.	141 grains.
2. 3455 "	144 "
3. 3699 "	154 "
4. 2555 "	106 "
5. 2050 "	86 "
6. 1932 "	80 "

It is observed that the amount of carbon is diminished by hunger and thirst, and increased by satiety and muscular exercise. It is greater during the daytime than the night, in the proportion of 1.237 to 1. And that if the quantity expired be estimated in relation to the weight of the body, it is found that children give off proportionally a much larger amount of carbonic acid than adults. This is a particularly important fact in relation to the school-room, justifying the argument of A. N. Bell, M.D., in his paper on the "Perils of the School-room," * that in the estimate of air space "*no deviation should be made on account of children*, whether in regard to the different members of a family or a school-room," and the statement of Mr. John Simon, quoted by the same writer, who observes that:

"It is to be desired that laws and regulations as to overcrowding should not proceed on the assumption that children (to any measurable extent) require less breathing space than adults. Against any such assumption, two facts have been

* "Public Health: Reports and Papers of the American Public Health Association," Vol. II., p. 483.

considered : First, that even healthy children, in proportion to their respective bodily weights, are about twice as powerful as adults in deteriorating the air which they breathe ; secondly, that the children will almost invariably have certain eruptive and other febrile disorders to pass through, from which adult life is comparatively exempt, and in which the requirement of space is greatly increased. And having regard to these conditions, I think it is best that children and adults should be deemed to require equal allowances of air and ventilation." *

The foregoing conclusions are confirmed by the more recent researches and observations of other authorities :

The circumstances influencing the amount of carbonic acid excreted, as summarized in Kirkes's "Handbook of Physiology," are in part as follows :

"The more quickly the movements of respiration are performed the smaller is the proportional quantity of carbonic acid contained in each volume of the expired air. Although, however, the proportional quantity of carbonic acid is thus diminished during frequent respiration, yet the absolute amount exhaled into the air within a given time is increased thereby, owing to the larger quantity of air which is breathed in the time. The last half of a volume of expired air contains more than the half first expired ; a circumstance which is explained by the one portion of the air coming from the remote part of the lungs, where it has been in more immediate and prolonged contact with the blood than the other has, which comes chiefly from the larger bronchial tubes. . . .

"*Bodily exercise* in moderation increases the quantity to about one third more than it is during rest ; and for about an hour after the exercise the volume of the air expired in the minute is increased about 118 cubic inches, and the quantity of carbonic acid about 7.8 cubic inches per minute. Violent exercise, such as full labor on the tread-mill, still further increases the amount of the acid exhaled." (Edward Smith.)

To fully appreciate the influence of the frequency of the respiratory movements and bodily exercise, on the amount of carbonic acid exhaled, it is necessary to bear in mind that age exercises an important influence over the frequency of the

* "Eighth Report of the Medical Officer of the Privy Council, 1865."

respirations as well as other functional activities; that, while the number of respirations per minute in the adult, in a state of quietude, is about 16, in infancy it is more than twice as frequent—from 44 to 30; from five to ten years of age it is from 30 to 24; from ten to fifteen, 24 to 20; and from fifteen to twenty-four, from 20 to 17. This greater frequency of the respiratory movements and corresponding activity in the other organic functions, accounts for the larger proportion of carbonic acid exhaled and confirms the conclusions before cited.

"For every volume of carbonic exhaled into the air, 1.17421 volumes of oxygen are absorbed from it, and 1346 cubic inches, or 636 grains, being exhaled in the hour, the quantity of oxygen absorbed in the same time is 1584 cubic inches, or 542 grains. According to this estimate, there is more oxygen absorbed than is exhaled with carbon to form carbonic acid. . . .

"The quantity of water exhaled from the lungs in twenty-four hours ranges from about 6 to 27 ounces, the ordinary quantity being about 9 or 10 ounces. Some of this is probably formed by the chemical combination of oxygen with hydrogen in the system; but the far larger proportion of it is water which has been absorbed, as such, into the blood from the alimentary canal, and which is exhaled from the surface of all moist animal membranes, particularly at the high temperature of warm-blooded animals.

"A small quantity of ammonia is added to the ordinary constituents of expired air. It seems probable, however, both from the fact that this substance cannot be always detected, and from its minute amount when present, that the whole of it may be derived from decomposing particles of food left in the mouth, or from carious teeth, or the like, and that it is, therefore, only an accidental constituent of expired air.

"The quantity of organic matter in the air is about three grains in twenty-four hours. (Ransome.) . . . The amount of oxygen in expired air, which may be taken as the average composition of the mixed air in the lungs, is about sixteen to seventeen per cent; in the pulmonary alveoli it may be rather less than this. From this air the venous blood has to take up oxygen in the proportion of eight to twelve volumes in every hundred volumes of blood, as the difference between the

amount of oxygen in arterial and venous blood is not less than that. . . .

"As regards the elimination of carbonic acid from the blood, there is evidence to show that it is given up by a process of simple diffusion, the only condition necessary for the process being that the tension of the carbonic acid in the pulmonary alveoli should be less than the tension of the carbonic acid in the blood." *

THE BLOOD.

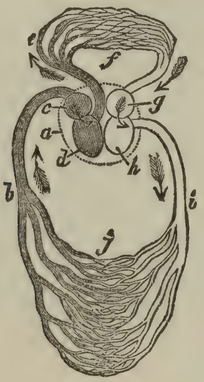
The blood is the medium for the reception and storing of oxygen and of all nutritive materials derived from food and drink and conveying them to all parts of the body for its development and growth and maintenance ; while it also takes up carbonic acid and other waste substances that result from the exercise of the vital processes, and conveys them to those organs whose function it is to separate them and cast them out of the body.

The whole blood of the healthy human body is estimated to be from one fourteenth to one thirteenth of its weight, so that the body of an adult weighing, say one hundred and fifty-six pounds, contains from eleven to twelve pounds of blood. And the wonderful activity of the circulation is such that the whole mass passes through the heart once in about every thirty seconds. But the velocity of the blood throughout the system varies inversely in proportion to the sectional area of the blood-vessels through which it passes at any given point. If, for example, the sectional area of all the branches of an artery or vein collectively were always the same as that of the vessel from which they spring, and if the aggregate sectional area of the capillary vessels were equal to that of the main trunk from which they diverge, the mean rapidity of the blood's motion in the capillaries would be the same as in the main arterial or venous trunk ; and if a similar correspondence of capacity existed in the arteries and veins, there would also be an equal correspondence in the rapidity of the circulation in them.

The arterial and venous systems of blood-vessels which communicate through the capillaries may be represented by two truncated cones with their apices at the heart, and their bases

* Kirkes's "Handbook of Physiology," by W. M. Baker, F.R.C.S., etc., and V. D. Harris, M.D., etc., 1885, Vol. I., p. 194 *et seq.*

united in a single sectional area—which is from four hundred to eight hundred times larger than the truncated apices. Hence it is evident that the velocity of the blood in the aorta and vena cava, and other main trunks, is at least four hundred times greater than it is in the capillaries. Moreover, the velocity is about twice as great in the arteries as it is in the veins —the capacity of the veins being twice as great as that of the arteries.

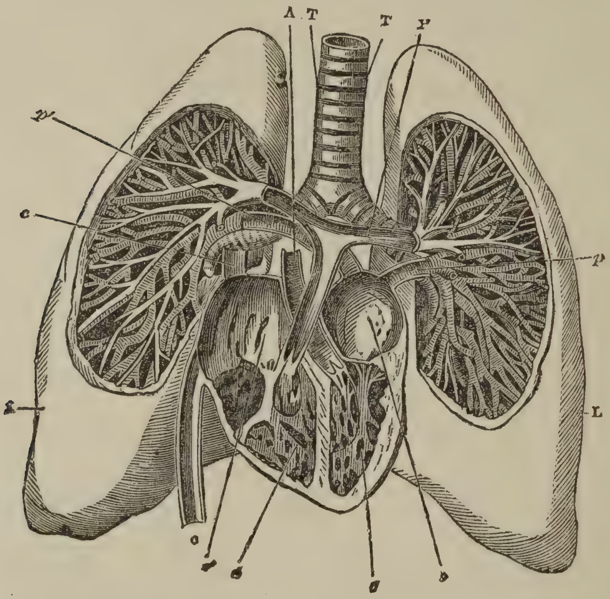


a, the heart, containing four cavities ; *b*, vena cava, delivering venous blood into *c*, the right auricle ; *d*, the right ventricle, propelling venous blood through *e*, the pulmonary artery, to *f*, the capillaries of the lungs ; *g*, the left auricle, receiving the aerated blood from the pulmonary vein, and delivering it to the left ventricle, *h*, which propels it through the aorta, *i*, to the systemic capillaries, *j*, whence it is collected by the veins and carried back to the heart through the vena cava.

In the circulation of the blood the heart is the central or chief agent.

The heart is a muscular organ of conical shape, about as large as the fist of the human body in which it is contained ; it is provided with four irregularly shaped cavities : two *auricles*, or ante-chambers, and two *ventricles*, or chambers. The blood enters the *right* auricle (*o*) by means of the two great trunk veins, the superior and the inferior *venæ cavæ* (*c* and *c*) ; passing thence into the right ventricle (*d*), this contracts and drives it through the *pulmonary artery* into the lungs. (The pulmonary artery is so called because it conveys blood *from*

the heart, although it conveys venous blood, for the blood-vessels do not receive their names from the kind of blood they carry, but from the nature of their office ; those which carry



blood *to* the heart are called veins, and those which carry it *from* the heart are called arteries.) In the lungs (L L), the blood passes into the capillaries, where, through the breathing membrane of the air-cells, it is brought into communication with the air which has been drawn in by the *trachea* (T), and is by the action of oxygen changed from venous into arterial blood. It now returns to the lungs by the *pulmonary veins* (*p p'*) and enters the *left* auricle (*o'*), whence it passes into the left ventricle (*g*) ; this contracts with great force and drives the blood into the great arterial trunk, the *aorta* (A).

The aorta gives off numerous branches that subdivide and ramify in all the tissues of the body, and ultimately terminate in the capillaries—these connect the arteries with the veins. It is, as before stated, through the capillaries that the blood comes into relations with and nourishes all the tissues, and it is also through them that impurities are eliminated and the blood purified.

It is obvious from this description that the two sides of the heart contain different kinds of blood. The right side contains dark colored or *venous* blood—loaded with carbonic acid and other impurities ; the left side contains red or *arterial* blood, charged with oxygen. The right ventricle, the pulmonary arteries, the capillaries of the lungs, the pulmonary veins, and the left auricle all belong to the respiratory or *pulmonic* circulation ; while the left ventricle, the aorta, the arteries of the body, the capillaries, and the veins of the body and the right auricle belong to the great or systemic circulation. And since the right side of the heart is completely shut off from the left, the blood must pass along each of these parts successively before returning anew to the same parts of the heart. When it has completed one tour of the system, it necessarily passes through the lungs before beginning another. It is while the blood is passing through the capillaries of the lungs that the change is effected from venous to arterial blood—from *dark* to *red* blood, by the excretion of carbonic acid and the absorption of oxygen.

The most remarkable peculiarity attending the circulation of the blood through the different organs pertains to

THE BRAIN.

It is variously estimated by different authorities that about one fifth of all the blood in the body is appropriated to the nourishment of the brain. Yet there is no part of the organism in which the progress to maturity is so slow.

According to Owen, "the brain has advanced to near its term of size at the age of about ten years, but it does not usually attain its full development till between twenty and thirty years." *

It is also important to observe that the child's brain is soft—that it contains a larger percentage of water than in after age, and that it is also deficient in fat and phosphorus, on which to a great extent intellectual development depends.

Of the structure of the brain at different ages, L'Heritier gives the following table, the numbers in each instance representing the mean of six analyses :†

* Owen's "Comparative Anatomy," Vol. III., p. 144.

† Traite de Chim. Pathol., 5. 596. Simon's "Chemistry of Man," p. 616.

	Infants.	Youths.	Adults.	Aged Persons.	Idiots.
Water..............	82.79	74.26	72.51	73.85	70.73
Albumen	7.	10.20	9.40	8.65	8.40
Fat	3.45	5.30	6.10	4.32	5.00
Ozmazome and Salts..	5.96	8.59	10.19	12.18	14.82
Phosphorus..........	0.80	1.65	1.80	1.00	0.85

That the brain is the organ of the mind, and that it is but the outgrowth and ultimate development of the tissues and organs of which the body in general is composed, and that its office is to unite all the functions and faculties of the body into one common bond, is among the most obvious conclusions of modern physiology.

"There is no part of the organism of man," says Carpenter, "in which the *reconstructive* activity is so great, during the whole period of life, as it is in the ganglionic substance of the brain. This is indicated alike by the enormous supply of blood which it receives; by the evidence furnished, by the presence of the products of its oxidation in the excretions, that it undergoes 'waste' proportionate to the demand made upon its activity; and by those microscopic appearances of its tissues, which mark rapid succession of developmental changes whereby that 'waste' is repaired. . . . Serious reduction in the quantity of blood to the brain at once produces *deficient* mental activity, while a *deprivation* of its quality occasions a *perversion* of that activity.

"And thus it comes to pass that very slight departures from the health of the blood exert a most powerful influence upon our *intellectual* and still more upon our *emotional* condition, through the deterioration they produce upon the circulating fluid. The functional activity of the brain is also affected, through its nervous connections, by the physical conditions of remote parts of the body, various aberrant phenomena being traceable to such morbid 'sympathies.'" *

The brain is the instrument by which we feel and think, and put into action the dictates of the will, and

"It is when the brain is *growing* that a definite *direction* can be most strongly and persistently given to its structure.

* "Principles of Mental Physiology, with their Application to the Training and Discipline of the Mind, and the Study of its Morbid Conditions," by William B. Carpenter, M.D., LL.D., F.R.S., etc., pp. 361 and 676.

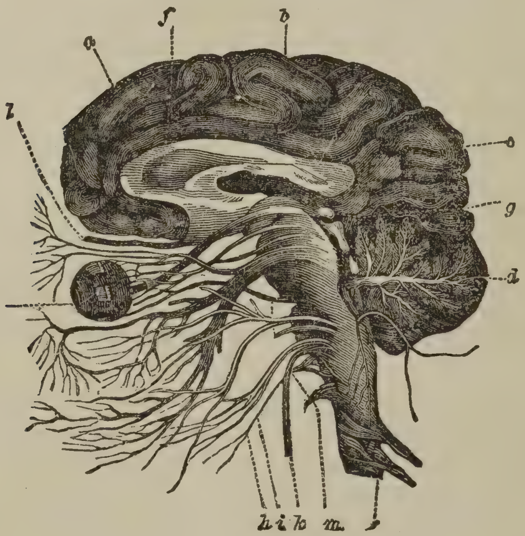
"Thus the habits of thought come to be formed, and those nerve tracks laid down which (as the physiologist believes) constitute the mechanism of association, by the time that the brain has reached its maturity ; and the nutrition of the organ continues to keep up the same mechanism in accordance with the demands upon its activity, so long as it is being called into use. Further, during the entire period of vigorous manhood the brain, like the muscles, may be taking on some additional growth, either as a whole or in special parts ; new tissue being developed and kept up by the nutritive process, in accordance with the modes of action to which the organ is trained. And in this manner a store of 'impressions' or 'traces' is accumulated, which may be brought within the sphere of consciousness whenever the right suggestive strings are touched. But as the nutritive activity diminishes, the 'waste' becomes more active than renovation ; and it would seem that while (to use a commercial analogy) the 'old-established houses' keep their ground, those later firms, whose bases is less secure, are the first to crumble away—the nutritive activity, which yet suffices to maintain the *original* structure, not being capable of keeping the subsequent additions to it in working order. This *earlier* degeneration of *later*-formed structure is a general fact perfectly familiar to the physiologist." *

The Nervous System, of which, in man, the brain is the centre and controlling power, is that part of the organism to whose welfare everything else is subordinate. It consists of the *brain*, the *spinal marrow* and *nerves*, and is divided into two chief parts, a *centre* and a *periphery*. The former consists of the brain and the spinal marrow, and the latter of the nerves in communication with this centre. The periphery, however, is subdivided, also, into two parts—the *centripetal*, which terminates in or receives and conveys impressions *to* the centre ; and the centrifugal, which transmits impressions *from* the centre, and stimulates the powers of the senses and motion. But besides these two sets of nerves, there is intimately blended with them a third class called the *Sympathetic System*, whose office it is to combine and harmonize the mus-

* Carpenter, *Op. cit.*, p. 442.

cular movements immediately concerned in the maintenance of life, and to bring these movements into relation with the *mind*—which is the grand purpose of the whole system of nerves.

It is through the medium of the nervous system that the involuntary muscles concerned in respiration, the circulation of the blood, and digestion, are stimulated to the performance of their respective functions ; it is also through the same means that we use our senses, feel and think, and set the voluntary muscles in action ; and it is the link to all the powers of the mind.



The brain is divisible into two hemispheres, right and left. This figure represents the inner surface of the right hemisphere divided perpendicularly from the left. The brain is also, for convenience of description, subdivided into three lobes : *a*, the anterior ; *b*, the middle ; and *c*, the posterior. At *f* is represented the *corpus callosum*—a broad white band which unites the two hemispheres, divided in the section ; *d*, the *cerebellum*, showing a peculiar arrangement like a bunch of leaves, and hence called the *arbor vitæ*, or tree of life. At *g* is represented the beginning of the nerve of sight, which distributes its

branches to the eye ; *l*, the olfactory nerve, distributed to the lining membrane of the nose ; *h*, nerve to the tongue ; *i*, to the throat ; *m*, to one of the muscles of the eye ; and the rest to various parts of the face, organs of sense, and to the vital organs.

It is this part of the nervous system, the top of the spinal cord, in particular, upon which the continuance of life essentially depends. At *k* is represented the exceedingly important nerve which sends off branches to the heart, lungs and stomach, by which these organs are enabled to perform their necessary vital functions.

"The brain," says Clarke, "is the axis or central organ of the body, which by internuncial fibres—telegraph wires—is connected with innumerable small centres called ganglia, and with every part of the system. The ganglia, or separate centres of nervous power, act more or less automatically, but are responsible to and in constant communication with the brain. Calling our mercantile friend the brain, his workmen the ganglia, his business the labor of the human organization, and we shall get a notion of nature's way of educating—that is, building a brain—sufficiently accurate for our present purpose. Just as the merchant grew out of his business by becoming acquainted with and supervising every detail of it, so the brain grows by taking part in and supervising the growth and function of every organ. If a single organ is wanting or a single function is not performed, just so much less brain development results." *

In the exercise of their functions the brain, nerves, organs of sense and sensations operate very much like the electric telegraph, except far more perfectly.

The wires of the electric telegraph extend well-nigh throughout the civilized world. In some parts they are carried on poles and over the houses ; in other parts, under the surface of the ground, on the bottoms of rivers, and even on the bottom of the ocean. They are connected at their outer ends with local offices at the various railroad depots and other places, where all the news round about is collected and transmitted through the wires by the local agents to a central office, with

* "The Building of a Brain," by Edward H. Clarke, M.D., p. 35.

which all the lines communicate, and by which they are regulated and governed, so as to keep the whole system in complete working order. So it is with the brain and the nerves, in connection with the organs of sense and sensation throughout the body.

The organs of sense are the watchmen and news-agents, whose duty it is to collect all the news of the surroundings—by listening, and looking, and smelling, and feeling, and tasting, and to convey the impressions they receive to the brain, by the connecting nerves. Sensations from *within* the body, like the external senses, are also ever alive to and watchful for its welfare ; and through the nerves by which all the internal organs are, in like manner with the organs of sense, connected with the home office, all the impressions received by them are also promptly conveyed to the brain. There is, however, this remarkable difference that, whereas in the telegraph system there is but one line of wire between the home office and the numerous stations, severally, by which messages are sent both ways, between the brain and each organ of sense and sensation there are *two* lines : one by which all sensations received are conveyed *to* the brain, and another by which responses are made, or messages are transmitted *from* the brain to the organs for their control and guidance.

For example : There is a special line of nerves to govern the action of the lungs in respiration. If the air becomes filled with smoke or any other stifling impurity, the impression is immediately conveyed to the brain, and the sense of distress obliges us to fly for relief to the fresh air.

It is the same with the organs of digestion. One line of nerves governs the digestion of food taken into the stomach. If anything is swallowed which causes disagreeable sensations at the time, the impression thereby created is taken up by another line of nerves and conveyed to the brain, and the mind is excited to the necessity of getting rid of the distress and the offending substance.

Thus it is that in proportion as we are made acquainted with the use of our senses and learn to use them well, we acquire the power of increasing and varying the facts upon which we rely for maintaining the health of our bodies and improving our minds.

Primarily, the too early enforcement of the child's mind has always been recognized by physiological observers as an evil of great magnitude. And no one who has carefully studied the conditions of development and growth will fail to recognize the danger of diverting the powers of the system during the period of childhood and youth.

The human body is constituted of a great aggregate of organs and interests—brain and mind, lungs and respiration, heart and circulation, stomach and digestion, muscles and motion, the senses and their exercise. When overtaken by fatigue the organs generally suffer ; and when by rest renovation has set in, they are as generally invigorated. But human beings are very unequally constituted in regard to their various powers, some being relatively strong in brain, others in muscle, others in stomach, etc.

The strongest organs receive a share of nutrition proportionate to their respective capitals : "To him that hath shall be given," is herein a governing principle. To what degree the brain, in particular, generally receives the lion's share, has already been shown. No less pertinent is the further qualification, that the organ which is the most active at any time receives more than its share. Hence to exercise the organs unequally is to nourish them unequally.

By excessive or premature exercise of the child's brain the flow of blood to it is increased and its powers stimulated and perhaps exalted for the time, but, on account of its softness and yielding nature, it is liable to plethora and consequent blunting of its powers instead of sharpening them. Meanwhile, by extraordinary exertion, the excess of blood to it has been withdrawn from the other organs, and failing of nutrition —waste of substance, muscular weakness and stunted growth of the body follow, with a possible premature development of the brain and mental precocity of short-lived energy.

Moreover, it not unfrequently happens that by too early efforts to educate the child, direct disease of the brain itself is induced. The constant pressure from the increased flow of blood to the brain is a frequent cause of convulsive attacks, sometimes of epilepsy, and if not speedily relieved, the mind degenerates into imbecility. Indeed, there is no limit to the baneful results of an overworked brain during school-life. It

not only involves an unsound body and a feeble mind, but a greatly depraved intellect. And some good observers, not without reason, attribute much of the intemperance and crime which prevail among the most highly cultivated nations—those who are foremost in measures for the promotion of education—to the feeble intellects and blunted sensibilities consequent upon the overworked brain during school-life.

In view of such dangers the question arises, At what age should children be sent to school? Children differ greatly in their powers of resistance to injurious influences, as do adults, though incomparably more susceptible to them; hence to fix upon the age at which school-life may be commenced involves the consideration of the *kind* of school-life as well as the adaptation of the child.

The first and central fact to be constantly kept in view in conducting school-life is the plastic property of the child's mind. This fact being always uppermost, healthy children at the age of about seven years may safely begin to learn the alphabet, spelling and figures on the Kindergarten system, giving them not more than two or three hours' application daily, with not less than half of the time, at equal intervals, for play; provided, always, the sanitary conditions of the school-room are duly regarded.

In proportion as the sum of the sensations is increased by the progressive development of the brain, with increasing age, the organic functions are strengthened, the sensations and motions which were at the first confused and uncertain acquire increased accuracy and direction, and at the age of about ten years systematic education may be commenced. But up to the age of puberty the school time should not be more than six hours daily, and no child should be required to devote more than half of the time of school hours to study, or more than forty minutes at a time to close application; and no *recitation* or blackboard exercise, which imposes the greatest exertion of the mind, should be longer than fifteen minutes.

With the increase of age and cerebral development after the age of puberty, while the brain ever presides over and, with the nerves, governs the healthy organism, it no longer maintains a preponderance of functional activity. It is, however, in intimate relation with every organ of the body. And it is

at this age, the age at which the brain has advanced to well-nigh its "term of size," that education may be advanced with increasing vigor. But the teacher should ever be mindful that in the art of teaching there is always a point of contact with physiology and hygiene, where the power of fixing the nervous connections which underlie memory may be so weakened by overpressure as to fail in their purpose.

Memory reposes upon nervous power, which, like every other power of the organism, is sustained by nutrition, and by having its alternations of exercise and rest. And while it may be stunted by inactivity, it may also be stunted by overwork.

(*To be continued.*)

THE BRAIN AND MORAL CULTURE.—Under the title of "Gehirn und Gesittung," Professor Meynert, of Vienna, read a paper before the last meeting of the German Association of Naturalists and Physicians (reported in *Berliner Klin. Wochenschr.*, N. 41), in which he considered the brain as an inhibitory apparatus against the lower and more instinctive natural impulses. The higher its development, the greater is the tendency to subordinate the particular to the general, and even in the lower animals we see a high state of social growth, as in the communities of bees and ants. In the development of the human individual, we see in the infant, a being entirely wrapped in its instincts of self-preservation, the "primary ego" is predominant, and the child is an egoistic parasite. As development goes on this standpoint is passed, conscience assumes its priority, the brain acts as a check on the purely vegetative functions, and the "secondary ego" takes precedence over the primary one ; and this is the general order of society we designate as civilization or social order (Gesittung). If this inhibition becomes weakened, as in progressive paralysis, then we see the disordered predominance of the natural instincts or impulses, and when it is totally lost the individual is in the position of a criminal, who opposes the ethical order of society ; a parasite, and one of the worst kind, one who not only lives upon his host, but destroys him in so doing.—*H. M. B., American Journal of Insanity.*

CONVENTIONAL MOURNING OR HEALTH?

WHICH shall it be? The time has come to choose. Unmitigated mourning must go. A movement has been started in England to put an end, if possible, to the present irrational mourning costumes that exact of women great personal inconvenience, physical injury, and disastrous expense. The conventional costume of a well-bred widow, for instance, possesses every known quality of unhygienic, non-æsthetic, and costly dress. Proper exercise while she is wearing it is out of the question. Seclusion is secured in ways less barbarous perhaps than inducing deformity of the feet, yet our occidental mourning customs effectually keep women within doors. The heart of the stoutest warrior might quail within him if a quiet stroll required the wearing of two crape veils, each six feet long originally and only slightly shortened, but not lessened in weight, by a hem half a yard deep—one veil to be worn over the face and the other to hang down the back! The widow's gown must be inconveniently long, the outside garment must cling, and both must be made of inelastic, non-inspiring material. Add to this that within, which passeth show, and the picture is pretty black. The husband who loses his wife escapes such outward trappings, not being forced to adopt any special habiliments that can incommode or injure him. A simple band around the hat announces the fact of his changed circumstances and secures freedom from idle questions. Strange inconsistency of custom that thus discriminates between men and women, and always to the disadvantage of women in point of health!

In this new crusade of common sense Lady Harberton takes the lead, setting forth in a recent article the reasons why existing mourning costumes should be abandoned by all sensible women. The materials now in use are in themselves injurious, the dyes being often of a poisonous nature and frequently injuring the skin and ruining the complexion. What woman who indulges in conventional mourning escapes the staining process resulting from damp crape? Only the victim can

know the energy and perseverance required to remove from brow and neck the literal clouds that gather from such a cause. The harm to the exterior of the body is easily perceived. Not less injurious is the irritation to the respiratory tract caused by minute loose particles of poisonous crape. To the pang of separation is added the thought that our loved ones are condemned to suffer physical discomfort for a year or two, and, possibly, disease for an indefinite period.

Lady Harberton suggests that persons should provide in their wills that no mourning should be worn for them. This might have a modifying effect upon things as they are. But, of course, the whole matter, like every other social and domestic question, rests entirely with oppressed womankind. Women are not driven into mourning at the point of the bayonet. The Quakers get along very well without wearing it at all. The sincerity of their grief is not questioned because they remain clad in every-day attire. If precedent is needed, it is pleasant to know that it already exists, and to realize the fact that scores of calm-browed, earnest-hearted nineteenth-century women have not needed mourning as a protection or a means of expression in the hour of affliction. Grief would seem to be a personal affair, sacred to the individual, needing no outward sign of its having taken the world into its confidence, and having thus cast something of a shade over the joy of living—said joy not being an inexhaustible mine in any community. Rather is the stock in perpetual need of increase.

The moral influence of mourning is even more to be deplored than its physical effects. Gloomy garments, darkened rooms, all the subdued life of the house of mourning, depress the powers, lower vitality, and absorb an undue quantity of domestic ozone. Such unwise fashions tend to stultify the wonderfully recuperative powers of time and nature. Hugging grief to keep it warm is a poor business, and so is the worship of sorrow. Speed the day when it shall be considered unbecoming to wipe our eyes upon the public or to dust our neighbors' shelves with any personal woe! All that Diogenes asked of Alexander was that the king should stand out of his sunshine. And we all have a right to demand of society that it take its mourning out of humanity's sunshine.—*New York Medical Journal.*

ABSTRACT OF THE PROCEEDINGS OF THE AMERICAN CLIMATOLOGICAL ASSOCIATION.

(*Continued from page* 262.)

DR. R. G. CURTIN, of Philadelphia, read a paper on

THE CLIMATOLOGY OF HÆMOPTYSIS IN CHRONIC LUNG DISEASES FROM AN ETIOLOGICAL AND THERAPEUTIC STANDPOINT.

In glancing over the field we are confronted by so many and varied influences of climate at work, both in causing and preventing hæmoptysis, that the subject will be best considered by taking up each factor separately, and discussing it as to its bearings and the symptoms under consideration, and its debilitating result. If the chronic lung disease is removed by climate, this, a mere symptom, is necessarily ended. We must be careful not to magnify hæmoptysis, a mere symptom, into the formation of a distinct disease.

First, I will give a brief summary of the more immediate causes of bleeding from the lungs in chronic pulmonary diseases. We are liable to hemorrhages from the lungs, caused—

1st. By capillary congestion of the bronchial mucous membrane.

2d. By congestion of the parenchyma of the lungs.

3d. From erosion of blood-vessels from the ulcerative process.

4th. Predisposition from condition of the blood, as in hæmophilia.

5th. Atmospheric influences.

6th. Nervous influences.

The hemorrhage may be bronchial, capillary, arterial, or venous. The principal climatic conditions affecting hæmoptysis are included under the following heads : Heat, moisture, and altitude, asepsis, rarefaction of air.

For syphilitic phthisis, denser air and increased arterial pressure are, I believe, beneficial in a curative way, as shown in my paper read before this society two years ago in Baltimore.

In cold air the tissues and blood-vessels contract, especially the capillaries, driving the blood from the periphery toward

the centre, but not with sufficient force to cause a dangerous internal congestion. It has a beneficial effect upon the appetite, and favors assimilation and strengthens the nervous system, imparting internal vigor.

Warm air.—The effect of continued warm air is to cause a debilitated and relaxed condition of the tissues and blood-vessels, which would in itself tend to the exudation of blood from the diseased tissue of the lungs.

Sunshine.—A patient living in the crowded city, shut between walls, and with perhaps many cloudy days, is subject to depressing influences. Remove a person so situated to a place with much sunshine and to out-door life and he will be benefited by such a change.

Each case should be carefully studied in all its phases before deciding upon a change of residence.

Dr. EDWARD O. OTIS, of Boston, read a paper on

PSYCHOLOGICAL FACTORS IN SELECTING A CLIMATE FOR INVALIDS.

To best adapt the remedy, be it climatic or medicinal, to the case in hand, the psychological side of the question, as well as the physiological and pathological, must have its due consideration. From a psychological point of view we ought to consider, 1st, the temperament and mental disposition. 2d. Previous habits and mode of life. 3d. The amount of physical activity the patient has been accustomed to. 4th. The matter of domestic ties. 5th. Is the patient to be placed in an environment of invalidism, where he will have his malady suggested to him continually by seeing others sick and dying with it about him? 6th. The age of the individual.

An environment of invalidism is almost unavoidable in most of the well-known health resorts. Besides these injurious influences, in other respects mainly it is in many ways unfavorable. To be sure, climate in a way makes us all akin, but in thinking of and helping an unfortunate brother our mind is diverted from our own misery to our benefit. On the other hand, however, to be among many others of the same disease as our own in its varying degrees and phases must often react unfavorably on our own disease.

Certain it is that the influence of an environment of strong

health, and, secondly, cheerful companionship about an invalid is more conducive to rapid improvement than one of invalids, with the constant reminder of the nearness of death. Lastly, the age of the patient as a psychological factor is important in considering the effect of the change to be made. It is true that "hope springs eternal in the human breast," but it springs more exuberantly in the young breast, and we can count more upon this universal element in human nature in the young than in the middle-aged and older. The adaptability of the young to change and new conditions is great, and with them we can venture on more radical changes than with the older, who are bound by long association to friends and places.

Dr. GRIFFITH E. ABBOTT, Bryn Mawr, Pa., read a paper on

THE BASIS OF RATIONAL CLIMATO-THERAPY.

We should guard against ascribing qualities to climate as peculiarly characteristic, which are disturbances either incident to acclimatization or are the result of our short-sightedness or the patient's carelessness.

Medical climate resolves itself into a microscopically pure air, equability of temperature, sufficient warmth and humidity, abundance of sunshine, protection from harmful air, air currents, and the presence of such arrangements and regulations as will enable the patient to lead a healthful life—a climate in which much outdoor exercise can be taken.

Dr. ISAAC HULL PLATT, of Lakewood, N. J., read a paper on

THE PINE BELT OF NEW JERSEY, A REGION OF SANDY SOIL AND PINE FORESTS.

New Jersey, though a small State, presents considerable diversity in its topographical and geological features. In the northern part it is traversed by the Kittatinny Mountains, a range of hills, part of the great Appalachian chain. The central portion is characterized by red sandstone with trap ledges, while the southern and eastern portions of the State consist of level country with a sandy soil and pine forests. Along the shore there are long stretches of shallow bays and tide marshes, and in the extreme southern portion many little rivers with

meadows lying along their banks. But running through the interior of the State there is a strip of land about sixty miles in length, and from eight to twenty miles in breadth, reaching from a few miles south of Freehold in Monmouth County almost to Vineland in Cumberland County. This region has long enjoyed a local reputation for healthfulness, and some portions have been mainly settled by people who have gone there for that reason. Extensive pine forests are a prominent feature of this region. They have been in some places cut off or burned, and in some spots are replaced by oak and other deciduous trees. But there are enough left to make it prominently a pine region.

The importance of soil dryness as a climatic element in prophylaxis of phthisis is too well known to need rehearsal. According to the reports of the State Board of Health, which are carefully prepared, and are, I believe, as accurate as any statistics of the kind, the whole number of deaths in the townships of Howell, Jackson, Manchester, Southampton, Woodland, Shamong, Winslow, and Hammonton, during the six years from 1883 to 1888 inclusive, was 1057, or an average of 12.16 per thousand a year. The number of deaths from consumption was 141, or 1.6 per thousand a year. In the State of New Jersey, during the same period, the total mortality was 18.65 per thousand, and the mortality from consumption 2.53 per thousand. Or, throwing out towns of over 5000 inhabitants, the total mortality was 15.07 per thousand, and the mortality from consumption 2.12. The comparatively low mortality from consumption will be rendered more striking if attention is called to the nature of the population of the region. The inhabitants may nearly all be included in two classes—the descendants of the original settlers, and those who have settled themselves in this region because of its supposed healthfulness.

A paper by Dr. S. H. CHAPMAN, of New Haven, entitled

NOTES ON THE PRESENCE OF DIPHTHERIA AT HIGH ALTITUDES,

was read.

In August last, during an excursion to Franz-Josefshöhe, 9500 feet high, into the heart of the great glacial region called Gross-Glockner, in Eastern Austrian Tyrol, my guide related

circumstances of an epidemic occurring during the early spring of the preceding year in his native village of Heiligenblut, which aroused my curiosity. On my return to the village of Heiligenblut, which is the starting-point of all excursions into that region of snow, I made inquiries of the factota of the village, of the hostess of the inn, who is the chief personage in all the Tyrolean villages, the postmaster, and telegraph operator. Their statements verified and amplified those made by my guide. Upon my return to Lienz I called upon the only physician of the town, who is also the military surgeon in charge of the government hospital for the district of Lienz. He gave me a description of his share in the epidemic. At the end of a week of the plague, as the peasants call it, notwithstanding the danger attending the journey, a messenger was despatched for a doctor, who, after a toilsome journey of two days, reached the village. The physician pronounced it diphtheria of virulent type. His treatment consisted of insufflation of sulphur and poultices on the neck. His treatment was so unsuccessful that the peasants had recourse to charms, prayers in the church night and day, and to the aid of an aged peasant, whose treatment saved more lives than the doctor's. It consisted of an ointment of sweet cream and powdered gunpowder rubbed in on the outside of the throat, and inside as well. The physician's statistics were sixty cases, forty-eight deaths. The disease was entirely unknown to the oldest inhabitant. The description of the disease was somewhat limited—namely, the crisis was reached in from two to three days ; besides the swelling of the glands and inflammation of the throat, there was even severe hemorrhage from the nose preceding collapse. There was no attempt made to isolate cases. I have related this incident to the society because of the interest attached to the extent of the development of diphtheria at so high and isolated a spot.

DR. G. M. GARLAND, of Boston, read a paper on

THE PATHOLOGY OF HÆMOPTYSIS FROM CHRONIC PULMONARY DISEASE.

For the convenience of our discussion we will assume that we are considering only cases of true pulmonary hemorrhage, wherein all extraneous sources of blood-supply, such as aortic

aneurism, cardiac rupture, etc., have been ruled out by the symptoms of the case. We can then roughly divide pulmonary hemorrhages into two groups : (*a*) cases which present physical signs of pulmonary disease ; (*b*) cases in which no physical signs of changes of lung structure can be found.

Our knowledge of the pathological causes of hemorrhage in the first group has been thoroughly digested by Virchow, Thompson, and others. We know that hemorrhages proper in this group come from deficiencies in the pulmonary system of vessels, while bronchial hemorrhage, or leakage from the arterial supply of the bronchial tubes, is slight in quantity and simply streaks the accompanying secretions of these tubes. No inference can be drawn from the color of the blood as to its source, because the oxygenation of the pulmonary blood is so rapid that it is expectorated red. Traumatic injuries of the vessels, and aneurism and diapedesis are familiar causes of hemorrhage in tuberculosis. According to Virchow, however, the greater number of hemorrhages in phthisis comes from ulceration of the vessels. In the second group we find no clinical evidence of changes in the pulmonary parenchyma. We may indeed locate the presence of blood in the bronchial tubes, but this does not necessarily determine the seat of the leakage, because the blood is rapidly drawn off into byways and side issues quite remote from its point of escape.

Pulmonary congestion is not of itself alone a prolific cause of hemorrhage. In whooping-cough and congestive bronchitis the amount of blood is rarely copious, and is the result of violent coughing.

This brings us to the consideration of the heart as a factor of pulmonary hemorrhage. Fernet says : "After tuberculosis, heart disease exerts the greatest influence in producing hæmoptysis, and mitral troubles stand pre-eminent in the causative list." Here also the element of exertion comes in, upon which Thompson lays so great stress. Prolonged exertion in walking and running leads to excessive hyperæmia of the lungs consequent upon the rapid emptying of the veins into the right side of the heart, and either the lungs give way under a condition of general congestion, with extravasation of blood, or local troubles of a similar kind occur ; or, on the other hand, the heart may become overstrained and give way in a condition of general dilatation.

THE DANGER OF SANITARY KNOWLEDGE!

THE *Sanitary Inspector* relates that, with a recent remittance by one of its subscribers came a note slightly complimentary and somewhat disapproving, the latter part of which was as follows:

"But at the same time I would not introduce your publication into a family, to keep nervous women in a state of alarm all the time about what they eat, drink, etc. Danger lurks on every hand, disease and death are always near, but we need not die a thousand deaths in anticipation. While there is nothing perfectly safe, some things are less dangerous than others."

Answering, we would say that we believe it always better and safer to teach and to learn the truth. It is true that danger lurks on every hand, but he who "dies a thousand deaths" in fearing it, is not he who knows where the danger is and knows how to avoid it, but he who fears a danger which he can localize only vaguely or not at all, and consequently does not know how or where to avoid it.

For instance, a little knowledge of what is now accurately known of cholera and cholera infection would greatly reassure a person who should be forced to dwell in a cholera infected town—indeed, generally diffused, such a knowledge would entirely do away with panic. Again, the nurse or night watch for a case of typhoid-fever with no knowledge of the peculiarities and the modes of attack of the infection of that disease, is subject to a serious danger whether he "dies a thousand deaths" in dreading the disease or not. On the contrary, such information as may be gathered from the *Sanitary Inspector* or the circulars of the State Board in a few moments will almost absolutely insure the attendants on cases of typhoid-fever against infection, providing they may have things about the patient as they ought to be.

It is just as well or a little better to show the child the difference between a hornet and a fly as it is to wait for the hornet to stab the bit of information into the little one. There

is not only the advantage of saving pain, but personal experience of this kind doesn't always teach. The hornet doesn't always wait to make apologies or for further acquaintance, and the pupil is not in that tranquil state of mind which is favorable to accurate entomological observation. The chances are six to a half dozen that he still doesn't know the difference between a hornet and a fly.

There are thousands of "nervous women" in the land that are kept nervous and miserable by causes which are easily avoidable, but which year in and year out are operative in dragging down the physical health, simply because these causes are unknown, unrecognized. This assertion is not merely the sanitarian's fancy—in innumerable cases it has been subjected to tests and counter tests. Whole households have ceased to be tormented with long prevailing illness immediately that sanitary defects in their homes were remedied. Whole towns have, after sanitary improvements, shown for a long series of years a death-rate greatly lowered from what it had been for a series of years before the improvement. (See also "Modern Sanitary Conditions," this issue.) If a knowledge of the principles of personal and domestic hygiene belongs to any one, it belongs to woman, the mistress of the household and its most constant guardian. With this knowledge she may banish many of the dangers, and along with them many of the vague fears of civilized life, and teach those under her care instinctively to avoid the bad and to choose the good.

HOW DRUNKARDS ARE TREATED IN NORWAY.—The London correspondent of the *American Practitioner and News* says that a well-known medical man, who has recently been in Norway, gives a glowing description of their manner of treating dipsomaniacs. An habitual drunkard in Sweden and Norway is treated as a criminal in this sense, that his inordinate love of strong drink renders him liable to imprisonment, and while in confinement it appears he is cured of his bad propensities on a plan that, though simple enough, is said to produce marvellous effects. From the day the confirmed drunkard is incarcerated no other nourishment is served to him or her but bread and wine. The bread, however, it should be said, can-

not be eaten apart from the wine, but is steeped in a bowl of it and left to soak thus an hour or more before the meal is served to the delinquent. The first day the habitual toper takes his food in this shape without the slightest repugnance ; the second day he finds it less agreeable to his palate, and very quickly he evinces a positive aversion to it. Generally, the doctor states, eight or ten days of this regimen is more than sufficient to make a man loathe the very sight of wine, and even refuse the prison dish set before him. This manner of curing drunken habits is said to succeed almost without exception, and men or women who have undergone the treatment not only rarely return to their evil ways, but from sheer disgust they frequently become total abstainers afterward.

THE LIFE OF A RAIL.—It is not economy to allow anything to be out of repair, on the supposition that it is less expensive than it would be to spend comparatively little from day to day to keep it up. The day of reckoning will come in the end, and the sacrifice will be considerable. As the track is the fundamental feature, the cross-ties or sleepers and rails should be the best. Iron rails are practically out of date, and it is fair to assume that the time is approaching when wooden ties will be things of the past. Where the traffic is light, heavy steel rails may not be necessary ; but it has been generally found economical to put in use rails which do not weigh less than sixty-seven or seventy pounds to the yard ; an even greater weight than this is not ill-advised—they require fewer cross-ties to the mile, and in consequence the force of men required to keep the track in condition is less. Light rails are soon worn and battered out on a road over which heavy engines are run and large trains are hauled. The powerful locomotives now built require a well-kept track and a solid and substantial road-bed. Heavier and faster trains have tended to reduce the average life of rails, even though the weight of the rails has also been steadily increasing. Circumstances vary on the different roads, but it is safe to say that eight to ten per cent of all rails in the track must be renewed every year. *—From "How to Feed a Railway," by Benjamin Norton, in August Scribner.*

EDITOR'S TABLE.

☞ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, 113A Second Place, Brooklyn, N. Y.

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THE AMERICAN PUBLIC HEALTH ASSOCIATION AND HEALTH EXHIBITION.

AT this writing, ten days before the time of meeting of this Association in Brooklyn, arrangements are well-nigh complete for the most auspicious meeting, it is generally believed, the Association has ever held. To the preliminary programme published in our July number, several important additions have been made, not the least important of which, by any means, is "The Art of Cooking," by Edward Atkinson, LL.D., Boston, Mass. This paper will be practically illustrated by cooking apparatus devised by Mr. Atkinson, and various foods will be cooked in the presence of the Association. The system which will be illustrated is the result of several years' labor, and has been in practical operation for many months under his supervision. As Mr. Atkinson is one of the world's most noted economists and statisticians, the paper will undoubtedly be of great value. This is the more interesting by reason of the Health Exhibition, at which there will be numerous specimens of foods, particularly of those prepared for infants and invalids. The programme of the meeting has been so generally distributed as to do away with the necessity of reprinting it in these pages.

THE HEALTH EXHIBITION is equally promising. The space is nearly all taken up, and it is already evident that the Committee was overcautious at the beginning lest their effort should not be fully met by the manufacturers and dealers in sanitary goods and appliances. The space, however, is being utilized in the best manner possible under the circumstances, and the Committee is intent upon making the best of its opportunity in this novel undertaking. In connection with the Exhibition, a series of addresses on sanitary subjects will be

given during the month of November, at the Brooklyn Institute.

Moreover, it is our purpose, in succeeding numbers, beginning with the November issue, to give a description of the Exhibit, in detail, and an abstract of the addresses in connection therewith, besides an abstract of the proceedings of the Association.

ADVICE TO THE PUBLIC REGARDING TUBERCULOSIS.

Le Journal de Médecine de Paris, of September 8th, 1889, publishes a note by M. G. Colin d'Alfort (read by the perpetual secretary of L'Academie de Médecine de Paris), protesting against the action of the recent Congress on Tuberculosis, in substance as follows :

It has not by any means been proved that the flesh of tuberculous animals, such as is found for sale in the markets, will cause tuberculosis. In the first place, it may be said that if the meat thus affected is a cause of the disease, there is scarcely an individual who would escape contamination, because tubercles are so common in the animals killed and offered for sale that there is not a single person who, having attained adolescence, has not eaten many times without his knowledge the flesh of animals thus affected. On the other hand, no experiment has yet been made to prove that the flesh or the blood of animals affected with this disease has ever caused tuberculosis in persons who have eaten it.

The same may be said in regard to milk, notwithstanding the doubtful and unsatisfactory experiments made by Gerlach.

Besides, experience and observation have not shown that tuberculosis is so contagious as the Congress has represented it to be to the public. Indeed, the inoculation with tuberculous matter is not successful, unless when the matter is broken up in the subcutaneous and intra-muscular cellular tissues.

The spread of the contagion from individual to individual seems to be very difficult, since in the country, notwithstanding the intimate association and the common use of household articles, the transmission of the disease is relatively rare.

The Congress has, therefore, exaggerated the danger of possible contagion from tuberculosis in the ordinary conditions of life, and the Academy should not follow it in the course it has taken.

T. P. C.

PREPARATORY EDUCATION TO THE STUDY OF MEDICINE IN THE STATE OF NEW YORK, AS REQUIRED BY CHAPTER 468, LAWS OF 1889.

1. The Legislature during its recent session enacted the following law to elevate the standard for admission to practice medicine :

AN ACT to provide for the preliminary education of medical students.

APPROVED by the Governor, June 13th, 1889. PASSED, three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows :

SECTION 1. Before the Regents of the University of the State of New York or the trustees of any medical school or college within this State shall confer the degree of doctor of medicine on any person, who has not received a baccalaureate degree in course from a college or university duly authorized to confer the same, they shall require him to file with the secretary or recording officer of their university or college a certificate showing that, prior to entering upon the prescribed three years' study of medicine, he passed an examination conducted under the authority and in accordance with the rules of the Regents of the University of the State of New York, in arithmetic, grammar, geography, orthography, American history, English composition, and the elements of natural philosophy, and such certificate shall be signed by the secretary of the Regents and countersigned by the principal or commissioner conducting said examination.

SEC. 2. This act shall not apply to persons who have already entered upon the prescribed three years' study of medicine, nor shall it alter the time of study or the courses of medical instruction required to be pursued in the medical colleges of this State by existing statutes.

SEC. 3. This act shall take effect immediately.

2. For the accommodation of candidates under the above law, special examinations will be held at the times and places noted in the annexed schedule. All correspondence on this subject should be addressed to Edward I. Devlin, A.M., the commissioner in charge of such examinations, at the Regents' office, Albany, N. Y.

3. All candidates must notify the commissioner, by letter, at least one week in advance, stating at what place and in

what studies they wish to be examined. No fee will be charged, and candidates will be informed of the result within twenty days from the close of the examination.

4. To insure success, the candidate should have a thorough knowledge of the whole of a standard school text-book on each of the required subjects, but cube root will not be included in the arithmetic examination.

5. Printed question-papers will be issued from the office of the Regents for each examination. The answers must be written in ink on legal cap paper, and arranged and numbered in the same order as the questions. Candidates should bring paper, pen, ink, and blotter.

6. Seventy-five per cent of correct answers is required in all subjects except orthography. In the latter study, the candidate must spell correctly eighty-five out of one hundred words, such as are commonly used in current literature.

7. In the examination in arithmetic the entire operation required for obtaining the result must be given, and the answer or result must be reduced to the simplest form.

8. The candidate must write at the top of the first page of his answer-paper (1) the place of examination, (2) the subject, (3) the date, (4) his own full name, (5) his post-office address.

9. At the conclusion of his answers on any subject, or at the expiration of the time allotted for such subject, the candidate must make and subscribe to the declaration given below, by writing on the lines immediately succeeding the last answer the words : *I do so declare*, and then his name. Every paper lacking this declaration and signature will be rejected. The declaration to which he thus subscribes is as follows :

Form of Declaration.

☞ Do you now, at the close of the examination in arithmetic (etc., as the case may be), conscientiously declare that you had no knowledge of the questions to be proposed, that you have neither given to any other candidate nor received from any source, explanations or other aid in answering any of them, and that you have not spent more than the allowed time? If so, write *in the next line after the end of your set of answers*, near the right side of the paper, the words,

"*I do so declare.*"

and underneath, *subscribe your name.*

10. All papers which fall below the required standard will be returned to the candidate. For those accepted, pass cards, certifying such proficiency, will be issued, and when all the subjects are completed, the certificate provided for in article 14 will be sent.

11. Candidates may offer at any trial one or more of the subjects required, and the subjects passed at such trial will be placed to their credit on the records of the Regents. In like manner, subjects passed in the regular Regents' examinations in the academies will be allowed and credited to candidates. Should a candidate allow an interval of five years to elapse without passing an additional subject, he will be deemed to have relinquished his candidacy, and will be dropped from the records.

12. Examinations in the subjects required by the above law also form a part of the system established by the Regents and conducted in the three hundred and eight academical institutions under their visitation throughout the State. The dates for the current academic year are November 18th–22d, 1889; January 20th–24th, 1890; March 3d–7th, 1890; June 9th–13th, 1890.

13. While candidates will find the special examinations better adapted to their purpose, they may enter the examinations held in the academies; *provided* in all cases, that they make application to the principal at least two weeks in advance, and pass the examinations in the several subjects at the same time and under the same regulations, as the candidates in attendance at such academies; and *provided*, that they pay to such academies, a fee of one dollar for each subject entered for examination. The answer-papers of persons so examined will be reviewed at the Regents' office in the same order as those of pupils in regular attendance, but they will lose no time by necessary delay at this office, if their papers are satisfactory.

14. Whenever all the subjects required have been passed by a candidate, and he has mailed to the commissioner, at Albany, a claim specifying when and where each subject was passed, the Regents will grant him a special certificate, known as the *Medical Students' Certificate*. This certificate is to be signed by the commissioner or principal conducting the ex-

amination. It will not be issued to pupils in regular attendance at an academy, but only to those who have finished their academic course and are actually entering upon the study of medicine.

15. The above instructions are subject to such changes as may from time to time be deemed necessary.

EDWARD I. DEVLIN, *Commissioner.*
MELVIL DEWEY, *Secretary.*

August 20th, 1889.

THE PROGRESS OF INFECTIOUS DISEASES AND MORTALITY RATES AT THE MOST RECENT DATES, BASED UPON OFFICIAL AND OTHER AUTHENTIC REPORTS.

ALABAMA.—*Mobile*, 40,000 : Reports 74 deaths during August, of which 26 were under five years of age. Annual death-rate, 22.2 per 1000. From zymotic diseases, 23, and from consumption, 4.

CALIFORNIA.—For the month of August, 1889, the Secretary's abstract of the reports received from 100 cities and towns, with an aggregate population of 830,415, the number of deaths was 809. Annual death-rate, 11.64. Deaths from consumption during the month, 139. From zymotic diseases : Diphtheria and croup, 26 ; typhoid-fever, 22 ; typho-malarial-fever, 1 ; cerebro-spinal-fever, 6 ; diarrhœal diseases, 17 ; whooping-cough, 10 ; scarlatina, 2.

San Francisco, 300,000 : During the month of August the number of deaths was 408. From zymotic diseases, 29 ; consumption, 71.

Los Angeles, 80,000 : 61 ; from zymotic diseases, 13 ; consumption, 10.

Oakland, 55,000 : 52 ; from zymotic diseases, 9 ; consumption, 8.

San Diego, 32,000 : 14 ; from zymotic diseases, 1 ; consumption, 1.

Sacramento, 35,000 : 23 ; from zymotic diseases, 2 ; consumption, 4.

DISTRICT OF COLUMBIA.—Total deaths during five weeks ending August 31st, 574, of which 262 were under five years of age. There were 271 deaths in the colored population. Annual death-rate, 26.30. Zymotic diseases caused 213 deaths, and consumption, 64.

FLORIDA.—*Pensacola*, 15,000: Reports for five weeks ending August 31st, 26 deaths, of which 9 were under five years of age. Annual death-rate, 18.27 per 1000. There were 6 deaths from zymotic diseases, and 2 from consumption.

ILLINOIS.—*Chicago*, 1,100,000. For the month of August the Commissioner of Health reports: Total number of deaths, 1703, of which 998 were under five years of age. Annual death-rate, 18.58 per 1000. From zymotic diseases there were 674 deaths, and from consumption, 126.

IOWA.—The *Bulletin* of the State Board of Health reports for the month of August as follows:

Scarlet-fever: Jackson Township, Keokuk County; Chancy, Clinton County.

Diphtheria: Hartley, Centre and Omega townships and Pringhar, O'Brien County; Stanwood and Fremont Township, Cedar County; Centre Township, Allamakee County; Waucoma, Fayette County; Mechanicsville; Stuart; Minnie, Dickinson County; Larchwood, Lyon County; Mingo, Jasper County.

Measles: Leon, Decatur County.

On August 26th Health Officer Bailey reported a new case of small-pox, a boy about six years old, at Mt. Ayr, and that the outlook was favorable for the presence of the disease for some time to come. And all this comes from an unfortunate reliance on vaccine virus that failed to work.

LOUISIANA.—*New Orleans*, 254,000: During the five weeks ending August 31st there were 512 deaths, of which 140 were under five years of age. Annual death-rate per 1000, whites, 19.16; colored, 25.98; total population, 21.03. From zymotic diseases there were 105 deaths, and from consumption, 82.

MARYLAND.—*Baltimore*, 500,343 : During the five weeks ending August 31st there were 994 deaths, of which 496 were under five years of age. Annual death-rate, 20.67 per 1000. There were 181 deaths from zymotic diseases, and 91 from consumption.

MASSACHUSETTS.—*Boston*, 420,000 : There were 973 deaths during August, of which 413 were under five years of age. Annual death-rate, 27.8 per 1000. From zymotic diseases there were 291 deaths, and from consumption, 100.

MICHIGAN.—For the month of August, 1889, compared with the preceding month, the reports indicate that cholera morbus, dysentery, cholera infantum, diarrhœa, and typho-malarial-fever increased, and that rheumatism, neuralgia, and inflammation of kidney decreased in prevalence.

Compared with the average for the month of August in the three years 1886–88, bronchitis, cholera morbus, and tonsillitis increased, and neuralgia and rheumatism were less prevalent in August, 1889.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of August, 1889, at twenty-one places, scarlet-fever at eighteen places, typhoid-fever at forty places, and measles at seven places.

Reports from all sources show diphtheria to have been reported in five places less, scarlet fever at twelve places less, typhoid-fever at twenty-two places more, and measles at six places less than in the preceding months.

Typhoid-fever is a disease which the State Board of Health has declared to be "dangerous to the public health," and as such it comes under the law requiring physicians to report to the health officials. Any physician who shall neglect to immediately give such notice "shall forfeit for each such offence a sum not less than fifty nor more than one hundred dollars." *After October 1st, any householder* who shall refuse or wilfully neglect immediately to give such notice shall be deemed guilty of a misdemeanor, and is liable to a fine of one hundred dollars, or in default of payment thereof, may be punished by imprisonment in the county jail not exceeding ninety days.

It seems important that the people generally shall under

stand this new law, which applies to scarlet-fever, diphtheria, small-pox, and all such dangerous diseases, as well as to typhoid-fever ; but at this time of the year typhoid-fever is usually most prevalent, and it is especially dangerous in times of drought, therefore the safety of the people may now be greatly promoted by having every case of typhoid-fever reported to the health officer, who is by law (Section 1, Act 137, Laws of 1883) required to promptly attend to the restriction of every such disease. A new law, which takes effect October 1st, makes it a misdemeanor punishable by fine or imprisonment for the health officer knowingly to violate that section of the law, or for any person knowingly to violate the orders of the health officer made in accordance with that section. But the actual penalties which are incurred by the violation of these laws are the *death penalties* to many of our people, about one thousand being lost in this State in each year from typhoid-fever. The saving of a large proportion of these lives is the real reason for the effort, in which it is hoped all our people will join, for the restriction of typhoid-fever and other dangerous diseases.

Detroit, 250,000 : Reports for the year ending June 30th, 1889 : Total number of deaths 3608, of which 912 were under five years of age. Annual death-rate, 15.65 per 1000. From zymotic diseases there were 934 deaths, and from consumption there were 320.

For the month of August, 1889 : Total deaths 345, of which 106 were under five years of age. Annual death-rate, 16.24 per 1000. From zymotic diseases, 139 deaths, and from consumption, 12.

MINNESOTA.—Distribution and mortality from specified diseases in Minnesota for the month of August, 1889, as reported up to September 20 : (Population estimated 1889, cities over 2000 inhabitants, 539,000 ; towns and villages, 1,047,860.)

Total number of deaths, 996, an increase of 58 over last month, 582 males, 414 females ; 57 per cent occurred in cities over 2000 population, against 68 per cent last month. Ages under 1 year, 46 per cent ; 1 to 5 years, 11.5 per cent ; 5 to 15 years, 6 per cent ; 15 to 30 years, 11 per cent ; 30 to 50 years, 9.13 per cent ; 50 to 70 years, 9.8 per cent ; over 70 years, 6 per

cent. Of 461 deaths under 1 year old, 54 per cent were in cities; from 1 to 5 years, 59 per cent in cities. Measles—5 deaths (2 males, 3 females), in 4 localities, 4 counties; 80 per cent occurred in cities. Ages, 2 under 1 year; one, 1 to 2 years; two, 5 to 10 years. Mortality and distribution one half compared with last month. Scarlatina—16 deaths (9 males, 7 females), in 8 localities, 7 counties; 31.25 per cent occurred in cities. Ages, 81.25 per cent under 5 years; 18.75 per cent between 5 and 15 years. Mortality greater; but distribution same as last month. Diphtheria—27 deaths (12 males, 15 females), in 10 localities, 10 counties; 71 per cent occurred in cities. Ages, under 5 years, 33 per cent; between 5 and 15 years, 59 per cent; an increase in mortality and distribution compared with last month, but about half that of same month last year. Croup—4 deaths (3 males, 1 female), in 2 localities, 2 counties; 50 per cent in cities. Ages, 75 per cent under 5 years; 25 per cent between 5 and 10 years. Mortality and distribution less than last month, and not half as large as same month last year. Typhoid-fever—40 deaths (21 males, 19 females) in 18 localities, 18 counties; 72.5 per cent occurred in cities. Ages, under 10 years, 7.5 per cent; between 10 and 20 years, 60 per cent; between 20 and 40 years, 17 per cent. As expected, approaching fall, mortality and distribution greatly increased compared with last month, but less than for same month last year. Diarrhœal diseases of children—248 deaths (148 males, 100 females), in 108 localities, 52 counties; 54 per cent occurred in cities. Ages, 79 per cent under 1 year; 15 per cent between 1 and 2 years. Mortality about the same as last month, but distribution much wider. Mortality 100 less than same month last year.

St. Paul, 180,000: Reports for August 175 deaths, of which 111 were under five years of age. Annual death-rate, 11.66 per 1000. From zymotic diseases, 81, and from consumption, 13.

MISSOURI.—*St. Louis*, 450,000: Reports for August 823 deaths, of which number 311 were under five years of age. Annual rate of mortality, 18.5 per 1000. From zymotic diseases there were 189 deaths, and from consumption, 44.

NEW HAMPSHIRE.—The following contagious and infectious diseases were reported for the month of August :

Diphtheria : Dover, 15 ; Manchester, 6 ; Claremont, 7 ; Newport, 6 ; Nashua, 6 ; Derry, 2 ; Rollinsford, 2 ; and Bethlehem, Concord, Moultonborough, Richmond, and Salem, 1 each.

Scarlet-fever : Manchester, 37—making a total of 186 cases since May 18th ; Tilton, 11 ; Berlin, 5 ; Concord, 6 ; and Laconia, Derry, and Claremont, 1 each.

Typhoid-fever : Manchester, 8 (3 imported) ; Claremont, 7 ; Concord, 6 ; Laconia, 5 ; Dover, 3 ; Hudson, 3 ; Bethlehem, 2 ; and Henniker, Hopkinton, Jaffrey, Walpole, Nashua, Moultonborough, and Weare, 1 case each.

Measles : Manchester, 1 case.

NEW JERSEY.—*Hudson County*, 282,254 : During the month of August there were 591 deaths, of which number 295 were under five years of age. Annual death-rate, 25.1 per 1000. The deaths from zymotic diseases numbered 164, and from consumption, 53.

Paterson, 85,000 : Reports 148 deaths during August, of which number 89 were under five years of age. Annual death-rate, 20.9 per 1000. There were 36 deaths from zymotic diseases, and 17 from consumption.

NEW YORK.—The *Bulletin* of the State Board of Health for August states that there were 9373 deaths reported during the month in 127 cities and towns aggregating 3,981,028 population.

The average mortality for August for the last five years is 8668 ; that of August, 1889, 9373, is less by 600 than that reported for August, 1888. The average proportion of infant mortality for five years is 45.5 per cent, and of deaths from zymotic diseases, 332.27 per 1000 ; for this month the proportions are respectively 40.7 and 280.75. From diarrhœal diseases there are fewer deaths than usual in August, and about 1200 less than in July. There is an increase in typhoid-fever, which began last month. The per cent of deaths from this cause in August for four preceding years is 1.72 ; of this month it is 2.40. The increase over last year is principally in New

York and Brooklyn; Binghamton reports an unusual number of deaths. Special prevalence is not reported from any place. Scarlet fever and measles are much less prevalent than a year ago. From consumption 109.46 deaths in each 1000 occurred, and 193.00 per 1000 deaths above the age of five years.

New York, 1,571,558: Total deaths, 3359—1593 under five years. Annual death-rate, 24.85. From zymotic diseases there were 998 deaths, and from consumption, 440.

Brooklyn, 821,525: Total deaths, 1505—776 under five years. Annual death-rate, 21.56. From zymotic diseases there were 277 deaths, and from consumption, 179.

Buffalo, 230,000: Total deaths (five weeks ending August 31st), 586—336 under five years. Annual death-rate, 26.48. From zymotic diseases there were 230 deaths, and from consumption, 29.

Rochester, 110,000: Total deaths, 219—107 under five years. Annual death-rate, 23.90. From zymotic diseases there were 70 deaths, and from consumption, 15.

Albany, 103,000: Total deaths, 189—74 under five years. Annual death-rate, 22.02. From zymotic diseases there were 52 deaths, and from consumption, 21.

Syracuse, 80,000: Total deaths, 138—55 under five years. Annual death-rate, 20.70. From zymotic diseases there were 61 deaths, and from consumption, 25.

The highest rates of mortality were as follows: Sag Harbor, 44.04; Gravesend, 44.0; Ramapo, 38.40; New Utrecht, 36.0; Tonawanda, 33.60.

The lowest rates of mortality were as follows: Delhi, 4.0; Baldwinsville, 4.0; Penn Yan, 5.33; Fort Ann, 5.60; Boonville, 6.0.

NORTH CAROLINA.—Aggregate population of the towns reporting for the month of August was 133,200, of which 58,315 were colored. Total deaths, 221, of which 148 were colored. Deaths under five years, 87, of which 58 were colored. Annual death-rate, 10.8 in the white population, 22.8 colored, and 16.8 in the total population per 1000. From zymotic diseases there were 68 deaths, and from consumption, 30.

Wilmington, 23,000: Total deaths, 45. Annual death-rate per 1000, 19.2.

Charlotte, 11,000: Total deaths, 22. Annual death-rate per 1000, 13.2.

Asheville, 10,000: Total deaths, 10. Annual death-rate per 1000, 12.0.

OHIO.—Fifty-three cities and towns, with an aggregate population of 1,145,180, reported to the State Board of Health for August 1574 deaths, of which number 753 were under five years of age. Average annual death-rate, 16.49 per 1000. There were 619 deaths from zymotic diseases, and 165 from consumption.

Cincinnati, 325,000: Total deaths, 473—232 under five years. Annual death-rate, 17.46. Zymotic, 143; consumption, 47.

Cleveland, 225,000: Total deaths, 513—290 under five years. Annual death-rate, 26.17. Zymotic, 229; consumption, 31.

Columbus, 101,000: Total deaths, 94—24 under five years. Annual death-rate, 11.16. Zymotic, 27; consumption, 17.

Toledo, 89,000: Total deaths, 115—64 under five years. Annual death-rate, 15.51. Zymotic, 49; consumption, 8.

Dayton, 60,000: Total deaths, 76—22 under five years. Annual death-rate, 18.24. Zymotic, 22; consumption, 17.

PENNSYLVANIA.—*Philadelphia*, 1,040,245: Reports for five weeks ending August 31st, 2159 deaths, of which 774 were under five years of age. Annual death-rate, 21.64 per 1000. From the principal zymotic diseases there were 424 deaths, and from consumption, 216.

Pittsburg, 230,000: Reports 454 deaths during the five weeks ending August 31st, of which number 231 were under five years of age. Annual death-rate, 20.3. From zymotic diseases (exclusive of diarrhœal), there were 81 deaths, and from consumption, 28.

RHODE ISLAND.—The number of deaths recorded in the different towns and cities during August, from which returns have been received, was 599, in an estimated population of 292,170. The annual death-rate upon the estimate given is 24.4 per 1000.

Providence, 127,000: Reports for August 230 deaths, of which number 88 were under five years of age. Annual death-

rate, 21.34. From zymotic diseases there were 78 deaths, and from consumption, 26.

TENNESSEE.—The principal diseases, named in the order of their greater prevalence, in the State during August were: Malarial-fever, dysentery, consumption, diarrhœa, cholera infantum, rheumatism, pneumonia, and tonsillitis.

Typhoid-fever is reported in the counties of Blount, Carroll, Cocke, Davidson, Fayette, Franklin, Gibson, Giles, Grundy, Hamilton, Hancock, Hawkins, Haywood, Henry, Knox, Lewis, Robertson, Sequatchie, Shelby, Smith, Stewart, Sumner, and Washington. Scarlet-fever in Anderson, Davidson, Giles, Hardin, Robertson, Shelby, and Smith. Diphtheria in Crockett, Hamilton, Knox, Lincoln, Shelby, Wayne and Williamson. Whooping-cough in Gibson, Giles, Henderson, Houston, and Knox. Mumps in Madison, Robertson, Wayne, and Weakley. Measles in Davidson and Robertson. Cerebro-spinal meningitis in Robertson. Erysipelas in Decatur, and chicken-pox in Williamson.

Chattanooga,	white,	8.44;	colored,	17.53 :	11.40
Clarksville,	"	21.60;	"	16.00 :	19.50
Columbia,	"	12.00;	"	12.00 :	12.00
Knoxville,	"	13.25;	"	30.07 :	16.69
Memphis,	"	32.95;	"	29.44 :	31.35
Nashville,	"	16.34;	"	20.06 :	17.67

MORTALITY DUE TO ACCIDENTS.

Several months ago Mr. William F. Barnard, at the request of the committee in charge, undertook to collate the mortality from accidents among the accident associations. His report, which was rendered at the convention of the associations at Coney Island last month, presents some interesting conclusions. They are necessarily crude, because that was essentially the character of the material on which Mr. Barnard had to depend, while that gentleman is, as he says, but an amateur at such work. But insurance statistics on this subject are exceedingly scanty, and notwithstanding their crudity, the following figures are of value. They represent those furnished both by life and accident associations.

The results are as follows: Accident experience: 149,445 persons exposed one year with a total loss by accidental death of 100, ratio .669 of one death per annum per 100 exposed, or in whole numbers one death to 1495 persons. Average length of exposure of those dying, one year five months nineteen days.

Life experience: 503,886 persons exposed one year with a total death loss from accidental causes of 302, ratio .599 of one death per annum per 1000 exposed, or in whole numbers one death to 1663 persons. Average length of exposure of those dying, three years four months and twenty-nine days.

Combined accident and life experience: 653,331 persons exposed one year with a total death loss from accidental causes of 402, ratio .615 of one death per annum per 1000 exposed; or in whole numbers, one death to every 1625 persons. Average length of exposure of those dying, two years eleven months seven days.

An analysis of the experience of the accident associations furnished the following results:

In the preferred or "A" class, 136,936 persons were exposed one year with a death loss of fifty-three. This is at the rate of .387 deaths per 1000 exposed, or one death to 2584 persons.

In the ordinary or "B" class, 5433 persons were exposed one year. Death loss seven, or at the rate of 1.288 deaths per 1000, or one death to 776 exposed.

In the medium or "C" class, 2779 persons were exposed one year, with a death loss of seven, or at the rate of 2.519 deaths per 1000 exposed, or one death to 397 exposed.

In the hazardous class, to an exposure for one year of 3581 persons, there were twenty-three deaths, or at the rate of 6.423 deaths per 1000 exposed, or one death to 156 people.

In the extra-hazardous class, in an exposure of 716 persons for one year, ten were lost by accidental deaths, the ratio being 13.966 deaths per 1000 exposed, or one death to seventy-two members.

In reference to his figures, Mr. Barnard says: "Let me not be understood as claiming for these ratios the authority of final results. The data upon which they are based are entirely too meagre to admit of any such claim. They are merely

submitted as indicating with some degree of accuracy the relative hazard of the several classes. I have learned from conversation with accident insurance men that it is the experience of all accident companies that the more hazardous occupations do not bear their own losses, and, as a necessary consequence, that the preferred occupations are always called upon to make good the deficit. Allowing any reasonable margin for inaccuracies arising from deficient data, the truth of the proposition is manifested, more especially if the ratios here shown as to accidental deaths are proportionate as to disabling injuries which, by analogy, would seem to be the same."—*Insurance Monitor.*

YELLOW-FEVER.—*Havana:* The number of deaths from this disease during the month of August was 76. The total number of deaths from all causes was 549.

THE TYPHOID-FEVER IN BORDEAUX.—In the month of October, 1887, an epidemic of typhoid-fever broke out in Bordeaux, and lasted until January, 1888, and caused a good deal of anxiety among the people. Dr. Vergely, the physician in charge of epidemics, was directed to inquire into the causes. He sent a communication on the subject to the Conseil de Salubrité, which was very exhaustive and will be of great value in the future.

The first thing worthy of remark is the rapidity with which the epidemic was developed. During the first eleven months of 1887, 116 deaths from typhoid-fever were registered. From the end of November to December 15th, there were 600 cases and 49 deaths; to January 31st, following, the approximate number of cases was 841, and the exact number of deaths registered was 125.

The greater number of the sick were in extremely poor health when attacked, and the locality in which they lived was very unhealthy, and the residents paid very little attention to the simplest rules of hygiene.

After M. Brouardel had shown the very important effect of water used in the household, as a vehicle of typhoid-fever, the cause of the epidemic was at first sought in the water used by the sick.

Dr. Vergely is clearly of the idea that the statement regarding the influence of water is too general, or that, at least, it cannot be clearly proved. In his opinion the air filled with dust and exhalations from fecal matter where typhoid cases exist may become an active means of contamination, and the disease may be disseminated in the clothes of attendants and in other ways. Again, refuse infected with typhoid stools may cause an epidemic, and in other cases the causes are complex.

"Certainly it would have been much easier and more agreeable for me," said he, "to decide, after a careful inquiry, that the water used in the family was the sole cause of the epidemic of 1888. We could have collected against the water a great amount of prejudice, a great deal of circumstantial evidence, many facts unimportant in themselves, suspicions transformed into facts, and finally, we would have only to pronounce the condemnation of the water-supply. But how often, in medicine, are we obliged to revoke decisions which when made were apparently most just and most conclusive. It was under the influence of such reflections that we felt bound to use great caution in studying the cause of this epidemic."

The most favorable conditions for the production of typhoid-fever were found to exist in 1887, in Bordeaux. The summer was unusually hot and dry, with numerous very severe storms intervening, which had reduced many persons to a condition of languor and great debility. The dry earth, reduced to powder, had covered the city with a thick layer of dust.

To this condition of the air and of the soil succeeded sudden and copious falls of rain, dense fogs accompanied with a high temperature—conditions very favorable to the development of infectious germs situated on the surface as well as in the soil. Besides, from the month of November to the month of December, two hundred and fifty-three trenches for the placing of water and gas-pipes were dug in different parts of the city. It was at this time that the epidemic broke out. Finally, for several months typhoid-fever had existed in many communes of the Gironde, which had daily communication with Bordeaux.

Relying on the new etiology of typhoid-fever, many physicians did not hesitate to attribute the epidemic to the water

used in the houses. The water of Budos, which had been introduced since the month of July, 1887, was the first to be blamed. But it was shown that the district in which the fever was most severe, did not receive any water from Budos. The other sources of water-supply were then successively blamed.

Dr. Vergely made a very careful inquiry into this matter. But, as he has clearly shown, he was unable to obtain any fact which would prove that the water could in any way cause the disease.

The analysis made to determine the presence of bacilla, by Professors Blazes and Dubreuilh, showed that the bacilla of Eberth and Gafky were not present. Of the waters that served for the analysis, some were obtained from the fountains in the city, some from the pipes in the houses, and some from the source from which the water was brought to the city.

Besides, the doctors who assisted Dr. Vergely declared, unanimously, that the disease had its origin in the part of the city in which the ordinary rules of hygiene were entirely neglected ; while other streets, although supplied with the same water, escaped the disease altogether.

Finally, on December 7th, the water which was blamed for spreading the disease, was entirely cut off, and when, in consequence, the disease should have been exterminated, or at least diminished, it had increased, and on December 18th it attained its maximum of severity.

All these conditions led the eminent epidemiologist to conclude that causes due to soil pollution had a preponderating influence in the production of the infection. He has formulated his conclusions as follows :

"The want of special sewers for the waters of the Taillan ; the many streets and the many houses in which this water has been used without any attack of the disease ; then the causes which can be assigned for the cessation of the epidemic, apart from the discontinuance of water in the district, seem to us to prove that it certainly was not the only vehicle of transmission. We cannot neglect to insist on the condition of the soil and the subsoil in the quarters in which the epidemic prevailed, and it is impossible to ignore the unhealthful condition of the places which have been pointed out by our associates in this inquiry."—*Journal d'Hygiene.* *T. P. C.*

MEDICAL EXCERPT.

ADVANCES IN SURGERY were admirably summed up by Dr. Phineas S. Connor, of Cincinnati, O., in his "Address in Surgery" before the American Medical Association at Newport, R. I., June 27th, 1889, as follows:

"When, in the amphitheatre of the Massachusetts General Hospital, 'the problem of surgical anæsthesia was definitely solved,' a new period began. Pain was no more, and it was permitted to examine earlier and more thoroughly, to remove more extensively, and to operate successfully in regions previously altogether, or in great measure, beyond the reach of art. For twenty years or more, progress was in the line of diagnosis, of development of new and better methods of operating, of extension of the range of surgical interference. Time was no longer an element of prime importance, and the work was regarded as quickly enough done when well and thoroughly done—too much so, in fact, for not seldom the best interests of the patient have been jeopardized by unnecessary delay in execution, that would not have occurred but for the existing profound insensibility. But though operations in this anæsthetic period were without much of the terrors of the olden time, yet they fell far short of producing the wished-for result in preservation of life and early restoration to health. Wound complications were still as ever the bane of surgery, and too often the wisest planned and best-executed operation resulted in failure because of the supervention of one form or other of septic infection.

"It is scarcely twenty years since patient investigation, careful experimentation and practical testing began to throw strong, clear light upon that most obscure of the subjects of medical study, the causes of disease. As never before in the history of medicine truly scientific methods of research have been adopted and pursued by a multitude of trained observers in all civilized countries, and surgery has entered upon its

scientific period, in which operator and patient are profiting by the labors of the chemist, the botanist, the physiologist, the physician, equally with those of the practical and experimental surgeon. It seems but yesterday when Lister's early papers startled the world. It is but twenty-two years since the first one was published, yet what enormous advances since then in knowledge, in treatment, and in the field of operative interference! A new department of science, surgical bacteriology, has been created (for what was done prior to 1867 may, for practical purposes, be left out of consideration), and in its development has been worked out the mycotic origin of all those pathological processes looked upon as inseparable from traumatisms, or almost necessarily associated with them if severe. Suppurations, gangrene, septic infection, erysipelas, tetanus, we know to depend upon the presence or the action of one or other of definite organisms that may be isolated, cultivated, and inoculated. Recognizing the cause, it has been comparatively easy to devise methods, more or less perfect in action, to prevent the development or neutralize the influence of it, and there has been worked out an antiseptic and aseptic wound treatment, the results of which are simply marvellous. But just here I must protest against the wisdom or the justice of the sweeping declaration of a few enthusiasts, who see in other than speedy recovery after injury or operation evidences of what they are pleased to consider criminal ignorance or neglect.

"The existing strong probability that in any given case septic infection might be prevented has given warrant for the performance of operations that in pre-aseptic days were not to be thought of.

"Intestinal surgery, that so short a time ago meant scarcely more than the removal of an ovarian tumor, too often carried until death was evidently fast approaching, now includes operations upon almost every part of each hollow and solid viscus, and laparotomy has taken its place, as a safe, proper, and often indispensable prerequisite to the determination of obscure disease. . . . It is not to be expected that all, or any close approximation to all, of these very dangerous wounds will be saved by early operation, for great injury will ordinarily be produced by the bullet, be it large or small; but every

case that recovers after section and suture may fairly be considered as rescued from an otherwise almost inevitable death. Unquestionably the laying open of the peritoneum and operating upon an abdominal organ has at times been carried too far. Useless work has been performed, and life has been sacrificed, for it is not true (so far, certainly, as operators in general are concerned) that abdominal section is in itself without danger, doing no harm if it accomplishes no good. But not a day goes by that, somewhere or other, life is not prolonged and comfort secured by an intraperitoneal ligation, suture, anastomosis, or excision, rendered proper—may we not say possible ?—only by the aseptic results of scientific discovery and experimentation."

Dr. WILLIAM OSLER, M.D., of Baltimore, read a paper in the section on the Practice of Medicine on

SENSORY ASPHASIA ; WORD-BLINDNESS WITH HEMIANOPSIA.

About one dozen cases of word blindness were now on record. The case reported was very typical. Patient could not pronounce words he saw, but could repeat them. He constantly misplaced words. He finally became paralyzed and died. There was softening on the surface of the brain, and deeper, as at the angular gyrus, and this softening was seen on the white matter, from the posterior horn of the gray matter, directly through to the surface. The word-blindness was undoubtedly due to the softening in the angular gyrus. The hemianopsia was due to a cutting off of the optic branches.

THEINE USED HYPODERMICALLY.—In chronic neuralgia and rheumatism, Dr. F. J. Mays prescribes theine in hypodermic injections of doses varying from 2 to 6 cgm. He recommends the following formula : Theine and benzoate of sodium, āā 3·75 gm. ; chloride of sodium, 50 cgm., aq. dest., 30 gm. Of this solution, 0·36 gm. contains 0·03 of theine.—*J. de Ph. et de Ch., February* 1*st.*

LITERARY NOTICES.

OPHTHALMOLOGY AND OPHTHALMOSCOPY FOR PRACTITIONERS AND STUDENTS OF MEDICINE. By Dr. HERMANN SCHMIDT-RIMPLER, Professor of Ophthalmology and Director of the Ophthalmological Clinic in Marburg. Translated from the Third German Revised Edition. Edited by D. B. ST. JOHN ROOSA, M.D., LL.D., Professor of Diseases of the Eye and Ear in the New York Post-Graduate Medical School; Surgeon to the Manhattan Eye and Ear Hospital. 8vo, pp. 586; one hundred and eighty-three wood-cuts and three colored plates. New York: William Wood & Co.

This work appears as Vol. I. of an apparent forthcoming series on "Specialties in the Practice of Medicine." The favor with which the German editions have been received, together with the reputation of the author and of the American editor, are well calculated to propitiate the favorable reception of the work by the profession in this country. Moreover, considering that the English translation of Stellwag's treatise, which has long been the only substantial standard on the subject, is now out of print, this work is singularly apropos to the present need of the profession. Besides comprising all that the treatise just referred to does, it includes all of the more recent advances and improvements in both the medical and surgical treatment and appliances on the subject of which it treats.

It might go without saying, considering the publishers, that the work is gotten up in excellent style throughout—paper, type, cuts, colored plates, and binding.

PHOTOGRAPHIC ILLUSTRATIONS OF SKIN DISEASES. An Atlas and Text-book combined. Hand-colored plates; nearly one hundred Cases from Life. By GEORGE HENRY FOX, A.M., M.D., Clinical Professor of Diseases of the Skin, Post-Graduate Medical School and Hospital, New York; Physician to the New York Skin and Cancer Hospital; Fellow of the American Academy of Medicine; Member of the New

York Dermatological Society, the American Dermatological Association, etc. To be published in twelve parts, $2 each. New York: E. B. Treat.

We have already had occasion to review the preceding parts, 1 to 8, of this excellent work (Vols. XX. and XXI.). Parts 9 and 10, now before us, comprise fibroma; onychauxis. Atrophic Diseases: albinismus; leucoderma; canities, alopecia; atrophia; trichorexis; onychatrophia. Neoplastic Diseases: cicatrix; keloid; xanthoma; neuroma; telangiectasis; nævus vasculosus; angioma; lupus vulgaris; l. erythematosus; scrofuloderma; syphilis. The text, though comprehensive, is concise, and the plates excellent.

MOTHER, NURSE, AND INFANT: A manual, especially adapted for the guidance of mothers and monthly nurses, comprising full instructions as to pregnancy, preparation for childbirth, and the care of mother and child, and designed to impart so much knowledge of Anatomy, Physiology, Midwifery, and the proper use of medicine as will serve intelligently to direct the wife, mother, and nurse in all emergencies. By S. P. SACKET, M.D. 12mo, pp. 387. Price, $2. New York: H. Campbell Co., Medical Publishers, 140 and 142 Nassau Street.

The title-page of this work very fully expresses its object. Five of the six parts under which its contents are divided—"Pregnancy and Confinement;" "Anatomy and Physiology of the Female Organs—Fœtal Development;" "Pregnancy and Parturition;" "Skilled Nursing and Midwifery," and "Ætiology, Symptomatology, Medication, and Nursing"—are in strict relation with the title. The subdivision of these subjects severally into short chapters, and the clearness with which they are presented to the reader's mind, are well calculated to impart much needful instruction to the two classes of readers—mothers and those about to become so, and nurses—for whom the work is especially designed. But the sixth and last part, "Remedies and Regimen," contains much that is beyond the sphere of both mothers and nurses, except under the special direction of the medical practitioner. Some of the remedies advised for the family medicine chest in this part require much more knowledge for their proper use than

that which commonly obtains in the household. Otherwise it is an excellent work of the kind, and, considering part sixth, alike commendable to medical students and young medical practitioners.

ALDEN'S MANIFOLD CYCLOPEDIA OF KNOWLEDGE AND LANGUAGE, Vols. XII. and XIII., DOMINIS–EXCLAIM, pp. 612, 632, continues to maintain its excellence. The particularly important articles in these volumes of singular comprehensiveness with conciseness, are education, 50 pages, comprising the most recent advances everywhere ; electricity and its various applications and advances, 44 pages. But these and other articles of apparent extraordinary length, commensurate with their importance, by no means detract from the leading feature of the work—an Encyclopædic Dictionary of Knowledge and Language, adapted to the needs of every reading household. Fifty cents a volume. John B. Alden, 393 Pearl Street, New York.

MASQUERADING MILK is the taking caption of a forcible letter in the Pittsburg *Despatch*, of September 22d, by CHEVALIER Q. JACKSON, M.D., showing that various mixtures dealt out by "milkmen" are not what they seem to be in either appearance or effects. Starch, lead, salicylic acid, germs of consumption, blood and pus corpuscles, are enumerated among his finds. All suggestive of the necessity of a rigid chemical police by the health authorities everywhere.

CREMATION OF THE DEAD, by WILLIAM B. CLARK, M.D., of Indianapolis, in the Indianapolis *Sentinel*, of September 22d, presents the special advantages of cremation from a sanitary point of view, with special reference to the prevention of infectious diseases and the increasing danger of water pollution by the seepage of cemeteries and graveyards generally. The more of such newspaper contributions the better.

DIXON'S NO. 786 BLUE PENCIL, with which the copy for this paragraph was written, is a decidedly labor-saving device over a pen, or any other pencil with which we are acquainted, for the ease and smoothness with which one can write with it on printing paper. It is made by the Joseph Dixon Crucible Co., Jersey City, N. J.

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SANITARY PROGRESS—WHAT HAS BEEN AND WHAT YET REMAINS TO BE DONE.

ABSTRACT OF THE ADDRESS DELIVERED BEFORE THE AMERICAN PUBLIC HEALTH ASSOCIATION, AT BROOKLYN, N. Y. OCTOBER 22D, 1889.

By H. A. JOHNSON, M.D., President.

HOW much the death-rate has been reduced in England in the last two hundred years, we do not certainly know, but there is reason to believe that in London it has diminished from forty or more in the 1000, at the beginning of the present century, to about one half that number. The plague is a grim spectre of the dead past. Small-pox is a Samson shorn. The increase in population has been correspondingly rapid. I think we may safely infer that the diminution in the death-rate and the increase in the population throughout Great Britain has borne some proportion, at least, to what has been accomplished in the metropolis. This increase of population has taken place notwithstanding the fact that during the last half century, millions have come from the British Isles to our own shores, while yet other millions have found other homes, and yet the work-shops of Britain are beehives, and the hill-sides of merry old England teem with industrious workers. A great change has been wrought in this last three quarters of a century. We know much more accurately how long people live, from what causes they die, and at what ages they die. We begin to see more clearly how the death-rate can be still more reduced. If we follow the course of a given number of individ-

uals from birth to death, as we can well do by the aid of statistical tables, we shall find that in England and Wales out of one million persons born, more than one fourth die in the first five years. If we divide the country into healthy and unhealthy districts, grouping together the different cities and counties according to the death-rate, we find that in the healthy districts only about one sixth of the million die within this first period of five years, while in the unhealthy districts, of which Manchester may be taken as a type, nearly one half of the million born die within the first five years. In other words, of a million of children born in the unhealthy districts, more than 280,000 die within the first five years for the want of proper sanitary care ; 280,000 would have lived beyond this five years if they had been born in the healthy districts.

The same startling contrast between the worse and the better districts will meet us if we study the later life history of this 1,000,000 of human beings.

By co-operation on the part of the people the unhealthy districts might be made as healthy as London, and as the other provincial towns and shires in which the death-rate is so low. In fact, Liverpool has within the last twenty-five years been transformed. It was one of the most unhealthy, it is now one of the most healthy of English cities. The application of money by scientific methods might change all this, and prevent this fearful slaughter of the innocents. . . .

The other field, and the one to which I more particularly desire to call attention, embraces the problems of public health. Society has always recognized certain evils growing out of aggregation, and has sought to control these evils. By legislative enactment and the establishment of police regulations, an effort has been made to secure the greatest good to the greatest number. Persons and property have been protected, crime has been punished ; and mainly with the motive to prevent crime. In these later years the obligation of the public to protect, not only the worldly goods of the citizen, but also his health, begins to be realized. An intelligent foundation has been laid for sanitary reforms. These consist, first, in the collection of statistics by which the value of certain procedures may be determined. The registration of births, deaths, and marriages, the causes of death, the collection of

information as to prevailing diseases, the collection and preservation of meteorological statistics, the collection and tabulation of statistics of the movements of the people, emigration, the growth of cities and States—all these accumulations serve as material out of which may be developed more accurate knowledge and better methods. Governments begin to recognize a responsibility in these matters. But, for the most part, legislation is still crude, and the administration of sanitary laws full of blunders. In this respect the history of sanitary enactments and their execution does not materially differ from that of other social and political reforms. It is the want of accurate knowledge that leads to our mistakes of legislation ; the want of practical acquaintance with the methods of administration that leads to the blunders to which we have referred.

As our oldest literature on sanitation was born of the pestilence, so our legislation has been stimulated by epidemics and has for the most part been provisional. Wise legislation must be based upon knowledge, knowledge on the part not only of professional sanitarians, but knowledge on the part of the public. It cannot be expected that this general or public knowledge will be technical; it must be general and related to the results that can be reached by scientific means and methods. A knowledge that begets faith in the agencies of protection and that secures efficient co-operation, and not, as has been too often the case, obstruction in the execution of sanitary laws. There are dangers, however, in this field of work, as in most others, that grow out of a smattering of knowledge. There will always be those who claim too much, who speak as having authority, but have not the wisdom to see the limitations and difficulties in the way of practical results.

While, therefore, we should by all possible means strive to instruct and interest the great public in the work of preventive medicine, the task of devising the means and methods must remain in the hands of those who have special knowledge of these matters. These specialists should not be taken wholly from the profession of medicine. As an illustration of what a layman may do, I have only to mention the name of England's greatest sanitarian, Mr. Edwin Chadwick. Through a long life he has devoted himself to the work of improving the

condition of London and other English districts, and it is safe to say that during the last fifty years his services have in value not been excelled by those of any Englishman in even the highest position of official or social life. What we want is on this side of the ocean such men as Mr. Chadwick. If we are to reach that measure of success which we believe to be possible, the world must not be left entirely to the medical profession or to health officers.

The egoism that leads manufacturers and others engaged in the various industrial occupations to ignore, in their eager pursuit of wealth, the public welfare, will always be an obstacle to the enactment and execution of health laws, but this general enlightenment on the part of the public which we so confidently look for, will compel obedience to these as well as to other forms of police regulation.

It is only within the last few years that sanitary organizations have come to be recognized as a necessary part of the machinery of State. Within the memory of many here present, there was not an efficient board of health in any city or State of this country, or in fact of the world. Police regulations establishing quarantine, it is true, existed, but these quarantines, instead of being beneficient in their character, were often useless, and in many instances they became monstrous crimes against humanity. All this is being changed. Society recognizes its obligations in two directions: First, to remove from its midst or destroy every possible source of disease, and to so control the causes that cannot be removed or destroyed as to diminish to a minimum their deleterious influences upon public health. Secondly, the obligation to prevent the introduction of diseases from without, by such measures as shall be found the most efficient for the accomplishment of this end, and at the same time work the least amount of inconvenience to the social and commercial interests of the community.

For the accomplishment of the first purpose we have already done something, but there remains much more to be done. There should be in every town or city or district a health authority. Under the direction of this authority there should be a survey first made with a view to determine the presence or absence of the physical conditions that unfavorably affect health. This study should include not only the natural con-

ditions, such as the climate, soil, exposure to sun and air, neighborhood, including water, wood, and elevation, etc., as suggested by Hippocrates many centuries ago, but it should also embrace the condition of the population, their nationality, occupations, dwellings, density, and food. It should also show the methods of removal of accumulations and, in the more populous districts, the disposal of sewage, the condition of streets and alleys, and the character of drinking-water. There should also be noted any special industries by which air or water may be contaminated. The bearing of most of these different industries upon public health is now well known. In addition to these studies of the surroundings and the activities of the population, there should be a careful collection and preservation of the statistics of births, deaths, marriages, the prevailing diseases, the causes of death, and the increase or decrease, if such be the case, of population. This is only a suggestion of a few things that should be done, and these should be done in the smaller towns and villages, as well as in the larger cities. . . .

It appears that the death-rate of twenty-six of the principal cities of America, with a population of 9,873,448, is 20 per 1000. I think it morally certain that this rate could be reduced, by means and methods *now known* to sanitary science, to 16 per 1000, and probably still less than that. The death-rate for London for the year 1888 was 18.5 per 1000. This can be still further reduced. That of New York and Brooklyn for the same year, taken together, was 25.5 per 1000—New York, 25.9; Brooklyn, 23.7. The death-rate of these two cities, if reduced to that of London, would secure a saving of 7 per 1000, or, annually, 15,986 lives. These lives are public wealth.

But this is not all. For one death annually two persons are sick during the entire year; or, in other words, there are two years of disabling sickness to one death—31,972 years, in New York and Brooklyn, of sickness, preventable sickness, annually. The value of these years of sickness cannot be reached with accuracy, but the wages lost on account of sickness, the cost of care and maintenance during sickness and convalescence, and the money value of the lives destroyed, considering them only as machines, will in New York and Brooklyn

reach annually into the millions. I venture to suggest to the business men of these cities that this loss is enough every year to buy a great railroad, or to build and subsidize a fleet of ocean-going steel steamships.

The sorrow of 16,000 homes, the years of grief, and the 32,000 years annually of anxious watching and waiting over the sick-beds of those who finally recover, are not taken into this estimate. Such considerations do not, except spasmodically, move legislatures or executives. It is only as these touch property, only as epidemics interrupt commerce, that we are able to secure efficient legislation. I firmly believe that the death-rate of nearly all our large cities may be reduced 3 to 4 per 1000 from the present rate. I am fully satisfied that this might be accomplished in our chief cities, and that sickness might be diminished in a corresponding degree.

This lengthening of years, this relief of distress, this saving of public wealth, is worth working for. What is true of the cities is, to a great extent, true of the rural districts. All over our broad land are farm-houses and small villages which become every year the seat of diseases that grow out of filth. Foul drains, foul water, badly constructed and ill-ventilated dwellings and school-houses are the cause of thousands of deaths every year—deaths that might be prevented by the application of acquired knowledge upon this subject. Sir James Paget, before the London Health Exhibition, discusses the problem of national health, and very conclusively shows that among the wage-earners of England and Wales probably one fourth of the sickness is preventable. Of the 20,000,000 of weeks lost by about 15,000,000 of the population, 5,000,000 weeks, or more than 95,000 years of work might be saved. This estimate is based upon the population between 15 and 65 years of age. The extension of this computation of sickness to all ages in Great Britain and Ireland would present us with a most startling array of figures. . . .

Up to the present time these problems of public health have received but little attention at the hands of statesmen ; but it is no longer a question of possibilities, it is certain that this great saving of the best kind of public wealth is within our reach. It may not be accomplished by methods hitherto used, but the result is possible by methods that are known and

which we know how to adopt. What we want is a recognition of the evil, and a disposition to invest at least a very small percentage of the loss in money value of life and work—wasted life and work—for the purpose of preventing this waste—hardly more than would be paid for the insurance upon our public buildings, or upon our dwellings in proportion to the value of the buildings themselves. . . .

We do not know with certainty how long life may be prolonged, but we are morally certain that it may be extended much beyond its present limits, and with a fair degree of usefulness. It is believed that its normal limit is about 100 years. Instead of about 40 years under the most favorable conditions, as at present, it is quite probable that 60 or more years should be attained by the best use of the means now known; that is, the average should be 60 or more years. With a better understanding and more faithful observance of health laws 40 additional years should be reached. This obedience to law, this adjustment of our surroundings and regulation of our whole being, mind and body, in accord with the conditions of physical health, will prove to be the only true elixir of life. . . .

The future is full of hope. Everywhere science, with the microscope and the crucible, is following the germs of disease and the agencies of death. Politicians even are beginning to think it is worth while to preserve the lives of their constituents. The great public is beginning to believe that something more potent than fasting and sackcloth can be devised for their protection from pestilence and the grave. Let us all work together and we can do much even now, and in doing what we know how to do we shall find out other ways to do still greater things. So shall we lengthen the cords and strengthen the stakes of the great tent of life, under which the cry of distress and wail of bereavement shall become ever less and less; while in swelling chorus shall be heard, through the ages, the laughing of children, the sweet voices of young men and maidens, and the strong words of old men and matrons.

OBJECT LESSONS IN SANITATION—THE HEALTH EXHIBITION, BROOKLYN.*

By A. N. Bell, A.M., M.D.

It has fallen to my lot as Chairman of the Committee on Exhibits, of the Local Committee of the Seventeenth Annual Meeting of the American Public Health Association, recently held in this city, to open the series of public addresses determined upon by the committee in connection with the Health Exhibition, which it is purposed to continue until the end of the present month. During the while there will be two addresses in this hall weekly, except Thanksgiving week, when there will be but one, appertaining to the same subject. Their purpose is to emphasize attention to, and to make the most of the object lessons displayed in the exhibit for the promotion of health.

This exhibit was undertaken under a realizing sense of the importance of object lessons in education; above all, in respect to that kind of education which is the most necessary of all mundane knowledge—the preservation of life and health. This knowledge is unfortunately for the most part in this community, we fear, as elsewhere throughout the United States, frequently offset by the erroneous impressions created by the legends of our hardy forefathers, who had none of the modern conveniences—conveniences that are held in contempt by persons in the inverse ratio of their knowledge of them. Our forefathers were indeed hardy, just as the aborigines were hardy, because none but the hardy lived. Approximately, according to the best information obtainable, the death-rate of our forefathers before there were any city condensations of consequence was about 25 per 1000 of population, or more than one fourth greater than it is at the present time. Estimating the population of Brooklyn at 800,000, and the death-rate at 21 per 1000, the number of lives saved in this city last year by the use of modern conveniences was upward of

* Address delivered at the Brooklyn Institute, November 4th, 1889.

4000. Yet not more than one fourth of the population of this city have a correct appreciation of what the most essential of the "modern conveniences" consist of. People generally have acquired some knowledge of the necessity of such conveniences, because they have learned that they are in some way related to approved methods used for the prevention of certain diseases; and when overtaken by such diseases, they are ever ready to attribute the fault to some outside influence or official, in default of any effort to possess and exercise knowledge on their own part for their prevention. Self-preservation, the proverbial first law of nature, is then brought home to such people, who are for the first time called upon to face a foe that knows no relenting, that always fights to the death, and is always prowling about the dark corners and hidden recesses, taking advantage of housekeepers who fail to make themselves acquainted with its hiding-places. Its favorite abodes are in the midst of uncleanly surroundings, the foul emanations of a dirty soil, unventilated houses and closets, badly constructed or neglected house drainage fixtures, among the accumulated rubbish of neglected cellars, foul ice-boxes, stale food, garbage and garbage buckets, soap-fat and its receptacles—in short, among the general accumulation and collects, within and without, of neglectful housekeepers, in default of practical knowledge of modern conveniences for the protection of health. And unfortunately most housekeepers, both male and female—and we mean no disrespect to their sphere, because the mass of people who do not fall within it are equally neglectful of this first law of nature to which we have referred, though they profess to be at all times greatly concerned and sometimes alarmed at the prevalence of preventable diseases—are, notwithstanding, apparently averse to the acquisition of such knowledge as would wholly thwart them. Indeed, the palpable aspect of the common mind is a constant endeavor to acquire knowledge of disease by actual experience, rather than the means by which it may be prevented. Sickness is practically preferred to health; cultivated, housed, and paid for, though it afflicts, impoverishes, and destroys; while the means for its prevention are unsought or ignored.

Few persons in this country, outside of some friendly societies and corporations, appear to have ever heard of the advan-

tages of competent health surveillance, even pecuniarily; to say nothing of suffering and its attending inconveniences. Hence our physicians take people at their word, and adapt themselves to the demand for their services. With rare exceptions they pay little or no regard to the universally prevalent causes of disease, because they have no inducement to; but they can afford to await and abide the sure consequences—the reward of their labors for treating the sick.

Medical practitioners everywhere, but nowhere more than in the United States, are proverbially self-denying; devoted to the duties of the sphere in which by common consent they have been placed; and they are never more devoted than when contending with disease amid danger to their own lives no less than to the lives of their patients, consequent upon preventable conditions. But there is no disguising the fact that, so long as physicians are employed and paid for attendance on the sick only, and not to conserve the health of the people and the household—so long as their living is made to depend upon the amount of sickness in the community and the household—there is little reason why they should devote their knowledge and time to the prevention of sickness. Their calling is to *prescribe medicine*, and very few there are, indeed, who, when called, have either the courage or the inclination to ascertain the faulty surroundings, and advise a change of regimen instead.

It has long been the practice in some Eastern countries for physicians to be habitually employed by individuals and families, as well as by royal households and corporations, on annual stipends or retaining fees, primarily for the conservation of health, but also to include attendance in all cases of illness; and it hardly need be added that the more sickness there is under this kind of professional service, so much the less efficient the service is esteemed to be. By the same standard our boards of health of all grades should be judged. We should then be likely to secure a health service of a better quality and of higher esteem.

Indeed, the day has gone by for intelligent people to con sider sanitation a privileged question, because there still remain some communities, legislators, corporate bodies, and public functionaries so ignorant of its requirements and bene-

fits as to consider it a subject of mere political preferment. And, unfortunately for its progress, there are some physicians with such superficial knowledge of its obligations as to be willing to shoulder them with this political estimate of their value.

To be useful, to be esteemed, sanitation—whatever it may have been in the past—must henceforth be aggressive. It is time that we should everywhere consider preventable sickness and mortality criminal sickness and mortality. When health officers of every grade are made to feel the force of this knowledge, practical sanitation will take the place of political preferment.

A State, city, town, or county without a competent health service has filthy and stifling court-rooms; churches and school-houses with a poisonous atmosphere; crowded and filthy almshouses and jails, approximating those of the great Howard's time; factories, shops, and seamstresses' dens of every kind, constructed and conducted without reference to the health of the occupants; habitual carelessness, cruelty to animals, and numerous "accidents." The highways and the byways partake of the same general condition, extending even into and throughout the households to filth storage in the back yards, food and drink, clothing and habits—all without notice, except a constant dealing with the results, are the characteristics of all such communities. Would that no such characteristics were ever manifest in Brooklyn!

As already referred to, in recent years some friendly societies, corporations, and mercantile concerns in this country, and a few in this community, have learned the practical advantage of sanitary surveillance. That such service has not long since gained a foothold in families is due to the lack of knowledge on sanitary economy.

With this general presentation of the importance of sanitary knowledge, attention is now invited to the utility of object lessons as a means of acquiring it.

A few years ago the Pedagogical Society of Berlin, with that greediness of knowledge which is so characteristic of the Germans, in an endeavor to get some idea of the contents of children's minds, before subjecting them to the influence of practical education, drew up a list of questions relating to

local objects, such as public buildings, squares, streets, etc. ; to the individual home life, to the farm, and objects of natural history ; while the children were also questioned on their notions relative to natural phenomena, religion, and their acquaintance with Bible stories and Grimm's tales. Eighty-four schoolmasters were invited to undertake the inquiry in the primary classes of their respective schools. Out of a little over two thousand children to whom the questions were put, trustworthy results were thought to be obtained from only one half the number.

Availing himself of the advantages and suggestions of this Berlin inquiry, Mr. Stanley Hall, of Boston, prepared a set of questions suitable to the surroundings of the children of average intelligence on their first entering school in that city. The problem he wished to solve was, "What may city children be assumed to know when they enter school?" The difficulty and sources of possible error which he saw stood in the way of its solution shows how completely he comprehended child nature. "Not only," says he, "are children prone to imitate others in their answers, without stopping to think and give an independent answer of their own, but they often love to seem wise, and, to make themselves interesting, state what seems to interest others, without reference to truth, divining the lines of our interest with a subtlety we do not suspect. If absurdities are doubted, they are sometimes only the more protested. . . . If a child," says he, "has seen a cow, but, when asked its size, points to his own finger-nail or hand, and says 'so big,' as not unfrequently occurs, the inference is that he has at most only seen a picture of a cow, and thinks its size reproduced therein, and accordingly he is set down as deficient on that question." On the other hand, the examination is not too strict ; "very few children know that a tree has bark, leaves, trunk, and roots ; but very few, indeed, had not noticed a tree enough for our 'pass.'"

Mr. Hall's tables show the percentage of ignorance of the various subjects of inquiry, and the relative ignorance of boys, girls, and children trained in kindergartens, and also of the children of Irish and American parentage. A few extracts from the tables will serve to show the kind of questions submitted to the children, and the nature and extent of the igno-

rance which was found to exist. Of common living things, 77 per cent of the children had never seen a crow ; 65.5 per cent, an ant ; 57.5, a sparrow ; 50, a frog ; and 20.5, a butterfly," * etc. Hence their conception of these things was only that which they had derived from seeing their pictures and hearing the descriptions as recited in the nursery.

Forty-seven years' active professional life, and fully half that period devoted to preventive medicine over an extensive field of observation, is my justification for citing this illustration of the importance of object lessons in education, but in nothing so much as in the acquisition of a correct knowledge of those things commonly termed modern conveniences for the protection of health ; because people generally, and women in particular, are so averse to such knowledge. Thousands of housewives and mothers there are in this community, who have the responsibility of the health and lives of their households depending upon them, who have no more knowledge of the proper construction and efficiency of the water-trap to the bowl, which is intended to protect the chamber from the germs afloat in sewer gas, than the child whose knowledge of a cow has been solely acquired from his picture primer. Yet such knowledge is by no means difficult of acquirement. It is not unlike other knowledge, even that which precedes the preliminary instruction comprised within the scope of the three royal R's. But this, it should go without saying, is not education, but the obligation to acquire it—instruction in the *principles*—out of which other knowledge is educible ; hence *educate*—to draw out and apply knowledge. And that which we call sanitary, and which we hold to be of the first importance, because it has to do with the preservation of health and the protection of life—without which other knowledge is of nothing worth—is educible from the same principles, and, to say the least, with equal facility as other knowledge, if people can be made to give it their attention. But this cannot be done by mere picture books, or the advertisements and circulars of the few manufacturers who have had the courage to respond to the demand for sanitary appliances.

These objects must be *looked at* to be appreciated ; between

* From the *London Journal of Education.* THE SANITARIAN, Vol. XV., p. 537.

which and reading the descriptions and seeing the pictures of them, or merely glancing at them in passing, there is an immense difference. And not alone in these things, but in many other things adapted to the maintenance and protection of health.

Among the first objects to attract attention, in a room by themselves, in passing through to the hall on the first floor, are garbage destructors, several designs, adaptable to the household or to municipal services. And where is the housekeeper, pray, to whom the disposal of garbage is not a continuous challenge to a wholesome atmosphere? or the community to whom it is not an opprobrium?

The efficient disposal of waste material concerns every individual in the community, whether in relation with the household only or the municipality; and in proportion as people become acquainted with the means adaptable to the accomplishment of this purpose, so much the sooner will they be applied.

In the room across the hall, opposite to that which contains the garbage destructors, is an exhibit of "Strawberry Hill Pork"—signifying pork that is not the product of hogs fattened on garbage. The projector of this enterprise it seems about four years ago conceived the idea that if he could raise and fatten the hog in the fields of his strawberry farm on pure and wholesome food, the quality of the pork would be so improved as, in a great measure, to do away with the common prejudice against its use. The result appears to be in a fair way of justifying his conclusion. That which is here exhibited is eminently worthy of examination. In the same room is a good display of "Hungarian Government Wines;" a new portable parlor, bed, and bath-room heater, by means of a patent fuel "without smoke or odor;" and an exhibit of the paraphernalia of the Brooklyn Branch of the Red Cross Society.

The most striking object in the lower hall is the "Durham System of House Drainage," constructed of wrought iron with screw joints, and consequently not liable to breakage. A particularly novel feature of this system is the manner in which the basins are provided for, trapped, and supported. The "Guy System of House Drainage" is also well worthy of attention. And there are, besides, in this hall, the "McClellan

Anti-Siphon Trap Vent;" an apparatus for flushing sewers; several varieties of sewer and drainage pipe, and an elaborate display of deodorants and disinfectants, of which there is an additional display in the hall above; an excellent exhibit of the most recent improvements in hot-air furnaces, and a combination of hot-air with steam; fire-place heaters and cooking ranges; and notably the "Aladdin" cooker, the invention of Edward Atkinson, LL.D., an oven so constructed as to be thoroughly heated with an ordinary oil lamp. It has a capacity equal to a large cooking range, and a considerable variety of foods may be cooked in it at the same time without any admixture of flavors. It is the same as that used by Mr. Atkinson, in which a large quantity and a great variety of food was cooked while he was describing it and explaining the method of its operation before the American Public Health Association two weeks ago. It is the most remarkable improvement in the economy of cooking since the time of Count Rumford. Another attractive object on the same floor is a "Family Ice Machine," by which a block of ice may be made in a few minutes. And beside it, there is the model of a safety-brake invention against railroad accidents.

On ascending to the upper hall, the first object to attract attention, at the head of the stairs, is a specimen of the "Backus Heater," by gas and steam. The opening or fireplace is occupied by an imitation log of wood made of cast iron. The lower half of it covers a peculiarly constructed burner, in which a current of air is introduced along with the gas, thereby producing a perfect combustion and a great intensity of flame, while a trough underneath filled with water, acted on by the heat, vaporizes and gives humidity to the atmosphere of the apartment, assists the combustion, and absorbs the deleterious gases which in other stoves escape into and vitiate the air.

On this floor there is a large display of prepared foods and nutritives, too numerous to particularize, but comprising the best kinds for invalids and infants; an assortment of the French soups, game, *patés*, etc., by the Franco-American Food Company; "Rexwheat," which comprises a good display of Cereal Foods; Milk and Butter, and Butterine. This last was removed by the exhibitor on Saturday, because the New

York State Dairy Commissioner objected to its display on the ground that it was inhibited by law, not because it was not a good food. It is evidently superior in all respects to the lower grades of butter on the market, much of which is unfit for use, and for which there would be no demand if this superior food were, as it should be, in competition with it.

The "Arnold Automatic Steam Cooker," "Coffee and Tea Cookers," and "Steam Sterilizer," fulfil many useful purposes in laboratories and hospitals as well as the household. There are several varieties of mineral water; one of Russian Caravan tea, and several of disinfectants.

Beginning at the end of the staircase, every visitor should examine one of the best and most recent improvements in wall papers that wash and contain no arsenic. Next to this is an "Indurate Fibre Bath-Tub"—remarkable for its lightness. The material is the same from which for several years pails and other ware have been made, so well and favorably known throughout this and other countries. Next follows a line of elegant closets and basins; a stack of "Rustless Iron" pipes; the "Connolly Globe Trap," made in glass; and a little farther on a variety of flexible wash-basins and infant bath-tubs made of water-proof material—surely one of the most delightful and healthful additions to tourists' and summer sojourners' outfits recently invented. The "Jenness Miller Model Bodice," "Equipoise Waists," and "Comfort Corsets" come next; and these are but the beginning of an elaborate display of elegant camel's hair and woollen clothing by the Warner Brothers, and the "Dr. Jaeger Sanitary Woollen System," suitable to all ages and seasons. Boots, shoes, and slippers of leather, rubber, felt, wool, and other material are equally worthy of attention. Adjustable parlor, library, reading, reclining, and invalid chairs at the end of the large hall suggestively point to a whole roomful of gymnastic apparatus on one side and a health-lift machine on the other, as excellent preludes to making rest enjoyable.

Finally, the doctors' sphere is not forgotten—their services are always required, sooner or later, even in an Health Exhibit. Two large rooms are appropriated to the most complete displays of pure chemicals and drugs ever made in this country. But to this the way is paved in the McKesson &

Robbins Exhibit, by a new health-promoting feature, the "Korkozy," a cork mat, upon which any one may step with the bare feet, to test the comfort with which it may be used by those for whom it is intended—those who would not have the luxury of the winter bath especially marred by the foot-touch of the bare floor or an oil-cloth. The same firm exhibits a complete set of chemical apparatus suitable for a health officer's laboratory, the antiseptics of the Lambert Pharmacal Company, St. Louis, a full assortment of the drugs used as adulterants and classified as injurious, in contrast with an elaborate display of pure drugs.

The adjoining room, also accessible from the passage-way at the head of the stairs, is wholly occupied by the exhibit of E. Merck, representing a selection of the most important medicinal products of modern progress in the art of chemical manufacture, eminently worthy the attention of physicians everywhere.

As people *will* get sick, it is important that they, as well as the doctors, should acquire knowledge of the means used for their recovery. We have in this exhibit the best results of chemical science in the manufacture of curative medicine. Of the quality of these drugs it may be safely said they are of the best, but their use must be left to those whose business it is to prescribe them as the *dernier ressort.*

Some people are always getting sick—catching cold, having bad headaches, or having sleepless nights, and when morning comes feeling so languid that they cannot get up ; and when they do get up, they have no appetite for breakfast, and feel, as they are, good for nothing generally. Others there are afflicted with all sorts of complaints—pains and aches in one place or another all the time, because they have never learned how to be well, and think it is no use to try ; they think it is God's will that they should be sick, and their duty to submit. Surely such people have never studied their Bibles, though they may have read them, or they would have learned that the Almighty has revealed Himself in His written Word, as well as in the book of nature ; that as His kingdom is over all His works, so His laws are immutable in mundane as in heavenly things, and should be regarded as reverently in the one as in the other.

It is a wise providence in the plans of the Creator that the existence of all organized bodies should be temporary. Man is no exception. And death may occur at any period of life, a few only ceasing to live by the effects of old age alone. The duration of life varies according to numerous appreciable and inappreciable circumstances; the original constitution of the individual, the habits of life, locality, and various other causes. And although it may not be in our power to comprehend all the various causes of disease that exist in nature, yet, by a due observance of the laws by which our functions are performed and their conflict with external circumstances, we can cultivate experience and observation to that degree of perfection which will teach us how to act prudently and safely.

Latitude, elevation, nature of the soil, degree of cultivation, relative position with regard to mountains, forests, rivers, etc., and general aspect of the neighborhood; as well as the immediate surroundings, all modify the condition of man, and more or less prove his adaptability and degree of endurance, by such effects as serve to make him understand his relations to what is around him.

We cannot prevent the dews of heaven, nor the heat of the sun, nor the processes of decomposition and transformation of organic matter. But we can understand the course and order of natural phenomena, we can trace out the laws that govern them and ascertain our relations to them. And if we apply this knowledge in tracing out the causes of ill-health, it will enable us to escape all such diseases as spring from ignorance and misconduct.

Health is perpetual youth. It is to feel the body a luxury, as every vigorous child feels, or as the bird when it shoots and quivers in the air, not flying for the sake of the goal, but for the sake of flight; or as the dog, when he rushes wildly across the meadows, or plunges into the blissful stream. But neither the child, the bird, nor the dog enjoys his cup of physical bliss with a felicity half so cordial as the educated conscientiousness of knowing how to keep well, and to feel that you have turned that knowledge to good account in preserving the health and saving the life of a fellow-being.

HYGIENE AND PUBLIC HEALTH.

By S. T. ARMSTRONG, M.D., United States Marine Hospital Service.

THE SALE OF TUBERCULOUS FLESH AND MILK IN SCOTLAND.—At a recent meeting of the Scottish Veterinary Association (*Glasgow Medical Journal*, July, 1889), the Government was petitioned to stop the sale of milk from animals suspected of being infected with tuberculosis, and to suppress the consumption of the meat of such animals, owners being recompensed for the value of the latter. This petition seems to be the outcome of a recent trial in Glasgow relative to the question of the condemnation of a whole carcass if tuberculosis was present in a limited portion, in which two carcasses were adjudged unfit for food. The grounds of the judgment were that tuberculosis in the lower animals was the same disease as tuberculosis in man ; that it was transmissible by ingestion of flesh or milk ; and that though the disease might seem limited to the viscera, the flesh appearing healthy, yet the tubercle bacillus might be there. It was ruled that, "except on the footing that the meat was the medium of transmission of the disease, it would be unnecessary and wasteful to exclude from the food-supply the carcasses of animals which had suffered from tuberculosis, however generalized and extensive." The interest of the public health, however, was paramount to the question of a small loss to the food-supply.

THE DISTRIBUTION OF DISEASE IN SOUTHERN INDIA.—In a paper on this subject by Surgeon-General George Bidie (*British Medical Journal*, July 20th, 1889), the results of a long residence in the Madras presidency are given. The territory has an area of about 149,000 square miles, with a population varying from 91 persons in Kurnool to 583 in Tanjore to the square mile. During the past five years the mean annual death-rate in towns was 24.9 in 1000 ; in the rural districts, 19.9 in 1000. The cold season is most fatal to natives, the hot months being healthiest. The moisture in the air, the daily range of temperature, and the character of the soil are de-

termining causes of disease. The cold, damp, clay soils cause pulmonary diseases, the alluvial soils cholera and bowel complaints, while the sandy and gravelly soils are generally wholesome. During twenty years the mortality from cholera was at the mean rate of 44.02 to 1000 inhabitants; the disease occurred in the water-logged alluvial land, the villages and towns being very dirty, and the drinking-water being taken from filthy irrigation ditches and shallow wells. Malarial fevers are generally prevalent in the low-lying districts, shunning the coast as a rule, and are rather rare in the rice districts; the death-rate is greater in the country (8.6) than in towns (6 in 1000). Fogs seem to increase the prevalence of fever, the moisture containing the malarial germs that are introduced through the lungs. Small-pox is quite prevalent—endemic, the author says. There is popular opposition to vaccination, and not more than 16 to 17 per cent of children are protected by vaccination; the mean annual death-rate is from 1 to 4 to 1000 of the population. Phthisis and syphilis are common, and the author considers that the latter predisposes to the development of the former. Beri-beri is endemic in various places, sometimes epidemic in the wet season, the germs being bred in the soil and carried in the air. Madura foot is due to a fungus, usually introduced by traumatism. Elephantiasis is endemic also; it is supposably due to a *Filaria*. Leprosy, 4.4 to 10,000, is held in check by the high mortality and low fecundity of those affected. Segregation is not practised.

THE PASTEUR INSTITUTE, PARIS.—According to the recently published proceedings of the Academy of Sciences, Paris (*ibid.*), 1673 persons had been treated in the institute. It was certified that all had been bitten by rabid dogs; and that the animals were rabid was often demonstrated by inoculation. There were 13 deaths, 6 occurring during treatment that was probably begun too late, 4 taking place soon after treatment, and 3 seeming to show complete failures of inoculation protection. It would have enhanced the value of the statistics if the number of dogs proved to be rabid by inoculation experiments was given.

THE HEALTH OF CHILDREN IN FOURTEEN LONDON SCHOOLS.—A committee to investigate the physical condition

of the pupils in London schools was appointed by the psychological section of the British Medical Association (*British Medical Journal*, July 27th, 1889), and, on account of the refusal of the London School Board to allow the investigation to be made in their schools, the observations had to be confined to fourteen elementary schools. The results of the examination are given, without comment, in a series of lengthy tables. There were 1944 boys and 1987 girls examined; among these there were signs of nerve weakness—nervous hand, weak hand, lordosis, toneless orbicular muscles of the eyelids, and finger twitches—in 207 boys (10.6 per cent) and 144 girls (7.2 per cent); with defective nutrition, there were 100 boys (5.1 per cent) and 84 girls (4.2 per cent); with mental dulness, there were 153 boys (7.8 per cent) and 78 girls (3.9 per cent); with cranial abnormities—rickets, large head, small head, dolichocephalus, narrow forehead, etc.—there were 166 boys (8.5 per cent) and 65 girls (3.2 per cent); with diseases or defects of the eyes—squint, hypermetropia, myopia, disease of the cornea, disease of the lids, cataract, nystagmus, loss of the eye—there were 74 boys (3.8 per cent) and 75 girls (3.7 per cent). One or more of the conditions were found in the same child occasionally. Only in defective nutrition and ocular defects were the sexes equal; strange to note, nerve-weakness was greater in the boys than in the girls, and the other defects were almost twice as common in boys as in girls.

THE TRAINING OF LOCAL HEALTH OFFICERS.—The chairman of the Section in Public Medicine of the British Medical Association (Dr. E. Ballard) has presented the results of his extensive experience with local health officers in a consideration of their necessary qualifications (*British Medical Journal*, August 31st, 1889). He considers that such an official should have a wider range of information than is requisite for the general practitioner, adding to the knowledge required by the latter an acquaintance with meteorology, geology, sewer and water engineering, the construction and ventilation of houses, bacteriology, and the laws governing epidemic contagia, and even the pathology of animals. His scientific education should be supplemented by a course of training under a health official; and he must never forget that he is not an autocrat, but always display tact in dealing with his constituency. In

the discussion on the paper it was agreed that the local health officer should be appointed by the State, to hold office during life and good behavior, and that the salary should be sufficient to permit general practice to be prohibited, no one being appointed to such a position unless holding the special qualifications in hygiene above noted, and, in addition to his general duties, to have charge of vital statistics, medical registration, and public vaccination.

THE INCUBATION PERIOD IN INFECTIOUS DISEASES.—Dr. James Finlayson (*Glasgow Medical Journal*, May, 1889), in preparing a code for the regulation of the school attendance of children exposed to or affected by infectious diseases, found that there was a decided diversity of opinion among authorities as to duration of the incubation period and as to the time of quarantine for children that had been exposed. The incubation period in scarlet-fever is given as low as 1 day and as high as 14 days, with an average duration of quarantine from 10 to 14 days; measles, from 3 to 17 days—quarantine, 16 days; rötheln, from 4 to 21 days—quarantine from 16 to 21 days; mumps, from 4 to 24 days—quarantine, from 21 to 24 days; whooping-cough, from 4 to 14 days—quarantine, from 16 to 21 days; chicken-pox, from 2 to 18 days—quarantine, from 18 to 21 days; small-pox, 5 to 19 days—quarantine, 16 to 18 days; diphtheria, 1 to 14 days—quarantine, 10 to 12 days; enteric-fever, 1 to 30 days—quarantine, 28 days; typhus-fever, 1 to 21 days—quarantine, 21 to 28 days; erysipelas, 1 to 13 days—quarantine, 10 days. As in the United States local ordinances involving this question require the physician to furnish a certificate to the child, the periods of quarantine above given may serve as precedents.

THE INFLUENCE OF THE CLOSURE OF SCHOOLS ON AN EPIDEMIC OF MEASLES.—The health officer of Cardiff, Dr. Edward Wolford, reports (*Sanitary Record*, May, 1889) that in the autumn of 1888 an epidemic of measles occurred among the children attending school, and, notwithstanding every effort to stamp out the outbreak by careful inspection, enforcing and advising ordinary precautionary measures, and distributing printed circulars of information, the disease became so prevalent that by the end of November almost one third of the pupils were ill or confined at home. The schools were closed

for four weeks, and the number of cases at once decreased; only four cases appeared among twenty thousand scholars after the schools were reopened. The author considers that the material was not exhausted, but that the comparative isolation of the children stopped the epidemic. This opinion is supported by the fact that in a previous epidemic, when the schools were not closed, the mortality was double that in the present instance.

CHILD MORTALITY IN DUBLIN.—Dr. T. W. Grimshaw (*Dublin Journal of Medical Science*, July, 1889) calls attention to the fact that, while the annual death-rate to 1000 in children under 12 months (115.5) and 5 years (36.6) is less in Ireland than in England or Scotland, yet in Dublin the rate in the first-mentioned class increases to 210.1 to 1000, and is higher than that of any other city in the United Kingdom. He considers that it is caused by: (1) The large proportion of poor in Dublin, statistics proving that the infant mortality in the working-class is six times as great as in the professional class. (2) The inferior house accommodations of the artisan and laboring classes, the larger tenement-houses accommodating 7.5, the smaller 4.8 families. (3) The intemperate habits of the laboring classes, statistical tables showing that a high death-rate is coincident with a high drink-rate, and that Dublin leads the United Kingdom in the latter feature. (4) Carelessness regarding the care of young, and especially sick children, this being demonstrated by the large number of uncertified deaths.

DISINFECTION BY STEAM AT HIGH PRESSURE.—Dr. A. D. Lübimoff (*St. Petersburg Inaug. Dissert.*, 1889, p. 54) has experimented with the steam disinfection apparatus of Geneste and Herscher and with a disinfection chamber in the St. Petersburg Clinical Military Hospital. The steam current had a pressure of six atmospheres. Strips of Swedish filter paper saturated with various microbes were put into test-tubes; these were placed in pillows, mattresses, and bundles of clothing, and kept in the disinfecting chamber from half an hour to three hours. The inoculated paper was then introduced into agar-agar or broth cultivation media. The experiments demonstrated that sporeless bacteria were killed in half an hour, while pathogenic microbes were entirely destroyed after an ex-

posure to steam at 113° or 114° C. The disinfecting chamber must be able to maintain this temperature for an hour and distribute the steam uniformly to all parts of the apparatus. Articles to be disinfected must be dry, because if damp they interfere with the height of the temperature ; and they should be distributed singly in the chamber, or be done up in small parcels. The management of such chambers should invariably be in the hands of medical men, and each municipality should have a public disinfecting chamber, as in Berlin. [The disinfecting apparatus of Geneste and Herscher is a metallic cylinder 1.3 metres ($4\frac{1}{4}$ feet) in diameter and from 2 to 4 metres ($6\frac{1}{2}$ to 13 feet) long. The cylinder is closed and made air-tight by means of two doors, supported on wheels, one at each end ; the doors are made steam-tight by clamp-screws. In the interior of the cylinder there is a car running on an iron track, on which the soiled articles are placed. Steam, generated by a neighboring boiler, enters the chamber by two sets of tubes —one to raise the temperature to 130° C., the other, pierced with holes 40 millimetres in diameter, to allow steam to enter the chamber when it is desired. The necessary pressure-gauges, thermometers, etc., are placed on the exterior of the cylinder.]

Disinfection and Isolation in Reference to the Control of Epidemics.—In opening a discussion (*British Medical Journal*, August 31st, 1889) on this subject, Dr. H. Franklin Parsons, after referring to the epidemic diseases, mentioned the experiments of Koch in destroying the spore-bearing and non-spore-bearing micro-organisms, in which that observer had proved that carbolic acid had an inhibitory effect on their growth, spore-bearing forms requiring immersion for one or two days in a five-per-cent solution, whereas a two-per-cent solution only killed them in a week. Sulphurous-acid gas, in a six-per-cent mixture, failed to kill spore-bearing organisms after four days' exposure. Dry heat (284° F.) would destroy spores in three hours ; but this temperature would injure all textile materials. Steam at 212° F. would destroy spore-bearing forms in five minutes ; and articles to be disinfected were easily penetrated by it. A watery solution of iodine or corrosive sublimate (one per cent), or chlorine or bromine (two per cent), would destroy spore-bearing organisms after one

day's immersion. The carriers of infection were the body of the patient, the excreta and the skin, the air tainted by exhalations from the sick, clothes, bedding, etc., articles of food, walls and floors of dwellings, collections of filth, dust on walls or in cracks, and sewage. The body may be disinfected by suitable washes, and, after death, buried in lime or charcoal. The air may be extracted from the sick-chamber and burned in a furnace or in a ventilator containing burning gas-jets. Discharges from the nose and throat may be received on rags and burned; those from the bowel and kidneys should be received in vessels containing a five-per-cent corrosive-sublimate solution. Clothing, bedding, etc., should be exposed to steam, or, where that is impracticable, boiled after having been immersed for some hours in a bichloride-of-mercury solution. Books and letters should be exposed to dry heat for some hours. Thorough boiling of water or milk, or cooking of food, will disinfect food stuffs. For house disinfection, sulphurous acid or chlorine is recommended, followed by scrubbing of the walls, removal of paper, and whitewashing where practicable.

In the discussion that followed, Dr. P. C. Smith, of Glasgow, considered that there were two divisions of the subject: disinfection and isolation; first, in hospitals; second, at home. Cities should have pavilions for the different zymotic diseases; towns, a cottage hospital, with a tent (or portable house) for small-pox; they should have steam disinfecting chambers, and the clothing of typhus and small-pox patients should be burned. At home the room occupied should be in the top story, divested of carpet and furniture, save a bed and chair for the nurse. There should be no communication between the nurse and the occupants of the house; food, etc., being placed on a table at the door. Disinfection of discharges, clothing, the room, etc., should be done as mentioned by the first speaker.

Dr. W. Squire, of London, considered the public establishment of good wards, good nursing, and care to attract the attention of those in need, as the first essential. If the hospitals could not care for patients until convalescence was completed, there should be convalescent homes. In the scarlet-fever hospitals in London, in 1887, 3000 patients had been treated, with a mortality of 267; in 1888, 4408 patients; in 1889, 5900

patients. These figures showed the increasing usefulness of those hospitals, and showed that the mortality from the disease had decreased.

Dr. Hope, of Liverpool, considered "domestic isolation" a fallacy, and instanced 80 cases of typhus-fever so treated, in which the disease had spread to 386 individuals of the families, with 62 deaths. Contrasted with this were 80 cases in which the patient was at once removed to the hospital and the house disinfected and cleansed, and no extension of the disease took place.

Dr. C. H. Allfrey spoke of the isolation of persons with infectious diseases in hotels, citing a case where great care had failed to secure rigorous quarantine. He advocated an association of hotel-keepers that would insist upon the removal of all members of an infected family as soon as possible, the declaration of all visitors that they were free from and had not been exposed to infection, and the establishment of a register of sanitarily certified hotels. [The British Medical Association adopted a resolution to this effect.]

Dr. Littlejohn stated that in Edinburgh the removal of patients with infectious disease was compulsory.

THE CONTAMINATION OF DRINKING-WATER WITH LEAD.—Dr. Sinclair White (*ibid.*), as the result of extensive experiments, concludes that acid water invariably acts on lead, the intensity of action varying with the acidity; new lead pipe being acted on more than old, the amount of lead dissolved increasing for the first twenty-four hours, and materially decreasing at the end of six days. Other things being equal, the greater the pressure of the water the greater the amount of lead taken up, and the greater the temperature the greater the solvency. A small amount of lime or soda diminishes the solvent power of the water, and filtration through limestone, charcoal, or spongy iron causes the water to become inert; filtration of water containing lead through the two latter substances will remove the lead. Where lead-dissolving water exists, wrought iron, tin, or glass-lined iron pipes and tanks should be employed, or the water should, before distribution, be filtered through beds of fine sand and broken limestone.

Dr. Fairclough believed that much of the anæmia of town people was due to drinking-water containing small quantities

of lead. He referred to the fact that some waters formed an insoluble crust on the interior of new lead pipes in two or three weeks, thus forming a permanent protection.

Dr. Whitelegge recommended that water pipes be made of Borff iron, as it had the property of withstanding rust.

THE PHYSIOLOGICAL VALUE OF MEAT FOODS FOR INVALIDS.—Surgeon-General C. M. Jessop (*ibid.*) believes that there is considerable waste in the preparation of beef teas, because nurses and cooks try to make a "clear" solution. Referring to the physiological metamorphosis of nitrogenous substances, he concludes that at least one hundred and thirty-eight grains of nitrogen, or six ounces of meat, is the smallest daily amount necessary for the bare maintenance of life. Yet the extractum carnis made by slowly heating, until it boils, a pound of finely-chopped beef in an equal quantity of water, is nothing but a solution of excrementitious substances and blood salts. Baron Liebig says: "By the addition of meat extract to our food, we neither economize carbon for the maintenance of the temperature nor nitrogen for the sustenance of the organs of the body, and therefore it cannot be called food in the ordinary sense. Dogs fed exclusively on extractum carnis die sooner than those not fed at all, which seems to be due to the deleterious influence of the potash salts contained in the extract." In prolonged illnesses the potash salts may impede nutrition by diminishing the absorption of oxygen by the blood globules, and, increasing the salts in the serum, interfere with the exhalation of carbonic acid. In an emergency one or two drachms of beef may be chopped to a pulp, placed in a cup with two tablespoonfuls of water, a pinch of salt being added, and the mixture heated for ten minutes and given at once. In making fluid meat-food there should be no remainder. Mince one pound of good beef, place it in a double boiler with two quarts of water, and boil for three hours, stirring it frequently with a wooden masher; pass it through a colander to remove the fibre, and season with salt if necessary. The mixture is wholesome and may be administered in necessary quantities every three or four hours.

CHOLERA IN MALTA DURING 1887.—In an interesting review on the Seventeenth Annual Report of the Local Government Board (for 1888), Lieutenant-Governor Hutchinson's

"Note on the Present Prevalence and Extent of Cholera in Malta," and Dr. S. L. Pisani's report as chief government medical officer for that colony, the *Practitioner* for May, 1889, concludes that an analysis of these reports demonstrates that, in the interests of public health and of the commercial interests of the world, "the antiquated and ever-failing quarantine restrictions should be done away with, and an efficient sanitary administration substituted for them." Cholera first prevailed in Malta from June 9th to October 11th, 1837—4462 cases occurring in towns, 3105 in villages; 2207 deaths took place in the former, 1585 in the latter. The second epidemic, imported from Barbary, lasted from June 9th to October 13th, 1850; there were 4029 cases, with 1736 deaths. The third epidemic lasted from June 9th to November 11th, 1865; there were 2362 cases and 1479 deaths. In the fourth epidemic, from July 5th to November 25th, 1867, there were 403 cases and 259 deaths. From August 3d to November 11th, 1887, there were in the towns, with a population of 60,629, 155 cases with 110 deaths; in the villages, with an aggregate population of 76,161, there were 471 cases with 352 deaths. In the villages the houses were often overcrowded, the ventilation was poor, there was no sewerage, and there was often no good potable water—the supplies being liable to pollution. In the towns the houses are drained, there are sewers, and there is a plentiful supply of good water. Consequently the epidemics have decreased in severity in the towns and increased in the villages. During the last four epidemics quarantine has been practised; nevertheless, means have been found to evade the restrictive law. Dr. Pisani concludes that, if the villages were drained and supplied with water, the houses of the poor inspected and improved, and all blind alleys opened, the island would become "an unfertile soil for the cholera germ." The *Practitioner* believes that a recognition of these facts—supported by the statistics of the towns of the island—and a disbelief in any efficiency in quarantine will enable Malta (as well as other localities) to avoid future epidemics.

Leprosy in the British Possessions.—In 1884 the medical profession of the Cape of Good Hope, says the *Practitioner*, became convinced that leprosy was increasing, and an

act was passed reciting this fact and providing that if a person was certified to be suffering from leprosy, he or she should be removed to a leper hospital, to be there detained. The disease is chiefly confined to the blacks and half-castes, though Europeans are affected. In Jamaica, where there are 700 or 800 lepers, there is a difference of opinion as to its increase. In Trinidad the number of patients in the hospital has increased, and it is maintained that this is out of proportion to the increase in the population. In British Guiana, where 1 in 500 of the population is leprous, the disease is believed to be increasing, not only among the coolies but among creoles as well. In Barbadoes the population has increased 6 per cent, leprosy, 25 per cent. In New Brunswick leprosy has decreased, but it has appeared among the Chinese in British Columbia. In India the census of 1881 gave 131,168 lepers; there is no evidence as to its increase or diminution. In the Mauritius leprosy is at a standstill. In Australasia it has appeared among the Chinese, Malays, Arabs, and Hindus. [There is certainly some leprosy in the Bahamas, for cases have appeared at Key West from there.]

THE HEREDITY OF LEPROSY.—Dr. G. A. Hansen, the discoverer of the *Bacillus lepræ*, has made an investigation of the present condition of 160 Norwegian immigrants that had settled in Wisconsin, Minnesota, and Dakota (*Arch. f. path. Anat. u. Physiol. u. f. klin. Med.*, cxiv.). He has been able to find only 13 of the original immigrants; a few more may be living, but nearly 147 are dead. Of all their descendants, so far as great-grandchildren, not one has become a leper. There are many Norwegians in those States descended from or related to lepers, yet the disease does not increase nor has it proved hereditary.

THE ROYAL COLLEGE OF PHYSICIANS ON QUARANTINE.—The arrival of the steamship Neva at Southampton, in June last, with one case of yellow-fever on board, caused the Privy Council Office to order her into quarantine for seven days. The *Practitioner* thought the Privy Council was to be congratulated that the occurrence took place at the only spot on the British coast that maintained a quarantine station (two hulks, at the entrance of the harbor). The Secretary of State for the Colonies submitted to the Royal College of Physicians

the question of the proper periods of detention for purposes of quarantine in yellow-fever, cholera, and small-pox. The college reported that the incubation period of yellow-fever and cholera was uncertain, and that the committee was of the opinion that it was unwise to impose quarantine restrictions in the case of these diseases. The committee was further strongly opposed to such restrictions generally, which it considered harmful and vexatious. In the case of small-pox the committee was of the opinion that the incubation period did not usually exceed a fortnight, and that suitable precautions based on this knowledge were desirable. The *Practitioner* does not consider the last paragraph of the report very helpful, especially as vaccination is the obvious means of preventing small-pox.—*New York Medical Journal.*

AN IRREPRESSIBLE MUSIC-BOX.—"I never felt so much ashamed of my life as I did yesterday afternoon," said a Member of Congress.

"What was the matter?"

"It wasn't anything serious; merely one of those occurrences which come in the most inopportune manner to embarrass a fellow. I called on a friend—a senator—and was obliged to wait for him some time. There was a decanter and a wineglass on his centre table, and, without thinking anything of the matter, I proceeded to help myself. Well, the confounded bottle was one of those April fool affairs that have a music-box concealed inside.

"The machinery of the box is so arranged that when it is tilted something or other slips its mooring and sets a popular melody going. That's just what happened to me. I replaced the bottle on the table while 'Paddy Duffy's Cart' was trundled through the atmosphere with diabolical distinctness. Of course, my host came in at that moment, and the smile that came over his countenance was scarcely perceptible, yet exceedingly cutting. Really, there was nothing wrong in my taking a glass of wine, considering my familiar footing at the house; but it was very funny for my host."—*Washington Post.*

THE PHYSIOLOGICAL CONDITIONS AND SANITARY REQUIREMENTS OF SCHOOL-LIFE AND SCHOOL-HOUSES.

By A. N. BELL, A.M., M.D., Brooklyn, N. Y.

(*Continued from page* 349.)

CO-EDUCATION OF THE SEXES.

WITH regard to *co-education of the sexes*, the writer fully agrees with the views so cogently expressed by Clarke and so well sustained by the distinguished observers he quotes :

"It is impossible and unnecessary to determine which of the three great divisions of the organization—the nutritive, the reproductive, and the nervous—is the most important. It is enough to know that the *consensus* of all is necessary to the development of each, and equally the development of each, to the evolution and perfecting of the whole. A normal periodical action represents, as a rule, the integrity and proper management of the apparatus, one of whose functions it is, as normal digestion represents the integrity and proper management of the nutritive apparatus. Its importance, then, comes chiefly from its representative character. It represents a system of organs and functions essential to the development of the individual and of the race—essential to the building of every woman's individual brain, and to the transmission of the accumulated brain power of the past. Whether we like it or not, we must accept the fact, men and women both, and act upon it, that the brain cannot attain its best development, except through the development of the body. 'I do not wish to be called a body, or treated as an animal,' said a bright woman. Her aspiration was just ; but, for its realization, it is necesary that the animal and the body out of which the woman is built should be made to contribute their share to the building of her brain. When that is built, its grandeur and beauty and power will conceal and transfigure the body. Women have been so long called angels by flatterers, and painted with wings by artists, and sung as goddesses by poets,

that some of them are indignant when told that they have bodies. It is to be hoped that men and women will be angels yet, and that the flatterers, artists, and poets are prophets in disguise; but, if this is to be the case, we may be sure that the *iter ad astra* is not over despised, mismanaged, and diseased bodies, but out of harmoniously-developed, acknowledged, and transfigured ones.*

"The practical application of these principles to education is less difficult than appears at first thought. Much, probably the larger part, of the difficulty will disappear as soon as our school and social order recognize periodicity as a factor in brain-building and education. After this is recognized, experience will be the best guide in solving all other difficulties; and the solution must be worked chiefly by women themselves. Fortunately, nature, though an implacable enemy, is the kindest of friends. Obedience to her smooths every pathway. Physiology assures the teacher and the home that nature only requires in this direction the normal performance of the function. Whatever does not interefere with its normal performance is admissible. So susceptible is it of management in youth, that cerebration alone will sometimes guide it. I have seen cases in which the prescription of study—mental work—alone was enough to turn its abnormal into its normal performance; and other cases precisely the reverse, in which study, emotion, or other mental excitement, especially at the juncture referred to, so checked or increased it as to insure disease and threaten life. Surely a function that is so sensitive and ductile during the age of development, and, if then mismanaged, so difficult of control in later years, and that represents such an important part of the female organization, should be reasonably guided and managed. Like every other function, its normal performance not only strengthens the organs represented by

* The animal part of man is thus observed to be, in a measure, independent of the human, and may maintain a separate existence. The characteristically human part of his organization, however, is not thus independent of the animal organs, but is united to them by an inseparable bond. The cerebrum is the flower of organic creation, its supreme coronation. Its vital integrity is maintained by the corporeal system. The radicle may live and flourish independent of the flower; but, if the flower be disconnected from the radicle, it speedily dies."—*D. A. Gorton, M.D., Principles of Mental Hygiene, p.* 19.

it, but the system at large ; so that special and general growth and power are gained by its appropriate management. It should not be forgotten, in this connection, that the pain (dysmenorrhœa) by which nature so often and so severely punishes a neglect of this function uses up—that is, spends, an amount of nerve-force in exact proportion to the pain endured ; and that this nerve-force represents power withdrawn from the brain. If proper methods of education are devised which will not develop pain, there will be greater nerve-force at command for brain work in adult life.

"Suppose education, instead of standing, as it generally does with us, for schooling alone, stood, as it ought to do, for all appropriate training, we might divide it into the four divisions of physical education, or exercise : social education, or society ; domestic education, or home life ; and technical education, or study. If not more than five hours a day, or, including music, six hours a day were devoted to studying, both in school and out, leaving the rest of the time for other purposes, we should probably find that nature's normal remission of education, her 'Sunday of monthly rest,' would take something like the following order—at least such has been my observation of it—*all girls would require a periodical remission of variable length, from the labor of physical education*, such as gymnastics, long walks, and the like ; and also *all* would require a *remission* from the labor of *social education*, such as dancing, visiting, and similar offices. The other two departments of education, domestic and technical, would only be interfered with in exceptional cases ; but, in these exceptional cases, the remission is of vital importance to the individuals themselves, and the school must provide for it, or be directly responsible for life-long invalidism, possible sterility, and death. If our schools continue to require *seven, eight, and nine hours* of daily study, including in this estimate out-of-school study, there should be a periodical intermission *for female pupils of school as well as of physical and social education.* The influences of school and social life are so interwoven, that it is difficult to separate them. There is an undoubted tyranny of fashion over them both, to which many yield an unquestioning and often a willing obedience. There is also a tyranny of the school over the family and social life, which presses lightly

on boys, but heavily on girls. A more flexible school system will abolish the tyranny of the school over the family; and a nobler civilization, that of fashion over social life.

"The stimulus of emulation, of constant, daily competitive work, affects the two sexes differently during the epoch of development. A boy is less susceptible to this stimulus at that time than a girl; so that when the same stimulus is applied to the two sexes, at the same time and in the same way, if enough of it is applied to keep a boy well up, it is a physiological injury to a girl; if only enough is applied to keep her properly at work, the result is a physiological injury to him.

"These and many other matters of detail, including co-education, must be determined by experience. Physiology is concerned only with the principles of healthy development, which, within their range, must guide the education of both sexes. Physiology demands an appropriate education for both, and condemns the effort, which, by consigning both to an identical education, would abolish nature's process of differentiation, and produce identical sexual development and the end of the race. Brains of highest worth must be built by an educational process that leaves men potential fathers, and women potential mothers. Sensuality must not be allowed to make animals of one sex, nor ill-regulated cerebration to unsex the other.

"An eminent English physiological authority has recently defended the thesis, that, because there is sex in mind, there must be sex in education.* I should prefer to alter the terms of the statement, and say, that, because there is sex in body, there must be sex in mind, and sex in education. When this is acknowledged, and one of nature's vital factors in brain-building, that has been so long refused a place in our training of girls, is added to the other factors of education, and entered in the rubric of the school, we may hope for brains of the largest development and finest quality. When that time arrives, we may hope for both sexes that identical will give place to appropriate education; that brains built out of the body and by the body, as well as out of books and by books, will crown and control every organ and function; that sex will be made

* Henry Maudsley, M.D., *Fortnightly Review*, April, 1874.

subservient, not to passion, but to reason ; and thus shall not only the grasp of our race be permanently assured upon this Western world, but the highest development of the individual, the noblest manhood and the loftiest womanhood, be assured here likewise.*

"From the time the brain has attained its full maturity the acquirement of new modes of action, and the discontinuance of those which have become habitual, are alike difficult. Both the intellectual and the moral character have become in a great degree fixed ; so that, although new impressions are being constantly received, they have much less power in directing the course of physical action than they had at an earlier period. . . . The readiness with which new knowledge is now acquired depends much more upon the degree in which it 'fits in' with those previous habits of thought which are the expression of the nutritive *maintenance* of the cerebral mechanism than it does upon the recording power which expresses a new formation. Further, during the entire period of vigorous manhood the brain, like the muscles, may be taking in some additional growth, as a whole or in special parts ; new tissue being developed and kept up by the nutritive process, in accordance with the modes of action to which the organ is trained. And in this manner a store of impressions or traces is accumulated (the mind is stored with impressions), which may be brought within the sphere of consciousness, whenever the right suggesting-strings are touched." . . .

"While then every one admits the special strength of those *early impressions* which are received when the mind is most plastic, most fitted to receive and retain them, and to embody them (as it were) in its own constitution—the importance of rightly directing the *habits* of thought and belief as really shaping that mechanism during the whole stage of bodily growth, comes to be still more apparent when we regard those habits as really *shaping* that mechanism, whose subsequent action mainly determines our intellectual and moral character, consequently the whole course of our conscious lives." †

Dr. Isaac Ray remarks that, "While it is easy oftentimes to see that this or that person is overtasking his powers, it is im-

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† "The Building of a Brain," pp. 56–65. * Carpenter, op. cit., pp. 442, 351.

possible to lay down any general rule on the subject, that would not require too much of some and too little of others. In *youth* and early manhood, especially if the constitution is deficient in vigor, there would be danger from a degree of application that might be safe enough at a later period, when the brain has become hardened by age and regular labor. So, too, habits of active physical exercise will enable a man to accomplish an amount of intellectual labor that would utterly break down one of sedentary habits. After making all due allowance for these differences, I think we may say that few can *exceed six hours a day* of close mental application without *seriously* endangering the health of the brain ; while, for most persons, a not unreasonable degree of prudence would prescribe a much shorter period." * The italics are the author's.

Dr. Ray's statement evidently refers to boys and men. It is undoubtedly true of them ; but it applies to girls during the epoch of development with much greater force than it does to boys.

Cramming is the bane of modern education all the way from the infant school to the end of the college course. Yet every thoughtful educator knows that what is too rapidly learned—that which is merely committed to memory—is commonly as quickly forgotten ; because the time for the acquisition of knowledge has not been sufficient to make a permanent impression. By overpressure one set of ideas drives out another, the memory is bewildered, and the power of fixing the thoughts on any subject enfeebled and uncertain. *Time* is an important element for the fixation of impression, and without it education in its truest and best sense is impossible. It is ever necessary in the acquisition of knowledge that all new ideas should be turned over and over and reflected upon in all their aspects, until they are not only added to what has previously been acquired, but until they so inter-penetrate and enlarge the sphere of conscious power as to become fixed thoughts engraved upon the memory, capable of being recalled for subsequent use. It is only when thus applied that every new idea planted in the scholar's mind will be engraven upon the brain as with an iron pen to endure as long as life lasts.

* Isaac Ray, M.D., "Mental Hygiene," pp. 110, 111.

It is the misfortune of the rising (?) generation that the educator, in the exercise of his art, assumes a certain average degree of physical health, and never seems to inquire into the means of keeping up and increasing the standard—all alike are pressed to the goal, save those who are wrecked by the impending wall.

Physiology teaches the general truth that memory reposes upon a nervous power sustained, like every other *living* power, *by nutrition*, having its equable alternations of exercise and rest. It also teaches that, like every other function of the human organism, the acquisition of knowledge is a series of new accessions to the process of mental enlargement by the establishment of an additional number of ineffaceable tracks on the brain.

Hence it is that for the intelligent practical work of teaching it is important to know and to note the conditions favorable and unfavorable to mental development.

It is necessary for the conservation of both mental and bodily health, that the consideration of all the known conditions that favor or impair the plastic growth of the system should be searching and minute. The inequality of different minds in imbibing lessons, under the very same circumstances, is a glaring fact which no teacher should forego; and it is the chief obstacle encountered in teaching numbers together—that is, classes. But the teacher's discrimination should by no means stop here. He should carefully note the physical ability as well as mental capacity of his pupils, together with the ways and means of quickening and increasing *their* discriminating aptitude, and using it to the best advantage. Always bearing in mind that the best brain is of but little value, if there be not enough physical strength to use it, and hence to undertake to satisfy the one source of power by sacrificing the other, is the folly of all others which juvenile prodigies most commonly illustrate. The same truth is applicable to the neglect of

THE EDUCATION OF THE SENSES.

What we ought to be able to do for ourselves in the use we make of our senses is evident from the power of our wills to control them; because, as a general rule, the intensity of the impressions received by the exercise of the senses is greatly

affected by habit. Hence it is that, by attention only, habit can be cultivated or avoided.

Attention is the power by which we realize the difference between simply touching a thing and *feeling* it ; between smelling and *snuffing ;* between mere passive vision or seeing and *looking ;* between hearing and *listening ;* between gulping and *tasting.*

It is also by attention that we gain knowledge of our bodily necessities—those conditions likely to do us hurt if neglected ; our natural wants, such as hunger and thirst, if too long endured ; excessive fatigue, if we become so absorbed in our studies as to be lost to the lapse of time ; indigestion, if we take improper food or drink, or neglect to take sufficient exercise in the open air ; the beginning of illness from neglect of its first indications. It is, in short, by attention, that we recognize the application of our senses and protect ourselves against acquiring the habit of neglecting their proper use or abusing them by over use, and the importance of decision and prompt action for their proper control.

Sensations not attended to, or those which have been injured by excessive use, or by use under unfavorable conditions ; or again, those sensations which have been wilfully abused and overpowered, notwithstanding the disagreeable and painful impressions at first excited by excess, cease to be of that benefit to us for which they were designed. It is in such cases as these only that "habit blunts feeling" is true, and not unfrequently to the destruction or, at least, greatly to the impairment of the power of the sense in question. For example :

The eyes become painful from the malposition or glare of light in the school-room ; by the small type or badly printed page, or color of the paper, as the case may be. The scholar not having been instructed in the proper care of his sight, by frequent change of position and extraordinary effort accomplishes the only object in view by both parents and teacher, until erelong irreparable injury is done, by the neglect of the chief avenue to mental improvement.

"That prolonged tension of the eyes" (remarks Dr Loring, in the paper already referred to) "may be the primal cause of a great number of diseases of the eye is admitted by all authorities, and the more fixed the gaze and the narrower the

field of view, the greater the danger. If it be true that continued tension of muscular and nervous force unduly exhausts the energy of any organ, it is doubly true of the eye. The nervous energy of the retina, sensitive and rapid as it is, is just as rapidly exhausted, and the act of reading would be unbearable after a few minutes, if the eye did not quickly change its position from letter to letter and from line to line. Diversity of action is as much a necessity in the case of the eye as of any other organs for an easy and lasting performance of its function.

"No eyes in my opinion should be used more than an hour, at the farthest, in the act of reading or writing, without an interruption of the gaze, and it would be better if several, if not many interruptions should take place in the same time. This usually happens in the case of adults for some reason or other; but children, in order to complete their tasks in an allotted time, are often compelled to use their eyes without sufficient interruption by the hour together.

"It would be impossible, and out of keeping with the condensed character of these remarks, to name all the diseases which may arise from prolonged tension of the eyes on near work. But there is one affection produced by it which is so frequent in its occurrence and so unfortunate in its results, that I cannot refrain from saying a word in regard to it, using substantially the language of one who is the greatest authority on the subject instead of my own.

"Professor Donders thus remarks: 'The distribution of near-sightedness chiefly in the cultivated ranks points directly to its principal cause—tension of the eyes for near objects. Respecting this fact there can be no doubt; three factors may here come under observation: First. Pressure on the eyeball in *strong* convergence of the visual axis. Second. Increased pressure of the fluids, resulting from accumulation of blood in the eyes in the stooping position. Third. Congestive processes in the eye, which, tending to softening, give rise to extension of the membranes. Now, in connection with the causes mentioned, the injurious effect of fine work is by imperfect illumination still more increased. To this it is to be ascribed that in schools where, by bad light, the pupils read bad print or write with pale ink, the foundation of near-sighted-

ness is mainly laid, which, in fact, is usually developed in these years.' "

These remarks, and the authority quoted by Dr. Loring, accord with the most distinguished living occulists everywhere. But while the sense of sight, because more intimately connected with the processes of school life than the other senses, suffers to an extraordinary degree, it would be an easy matter to show that the common neglect of the education of the senses in general is a frequent cause of other diseases, both physical and moral.

Rest and recreation lie at the very basis of development and growth. Who that does not know how the ear wearies under continued intense sound? the eye by steadily gazing? the overpowering effect of too long exposure to odor? the painfulness of taste or touch—even though agreeable at first—if too long persisted in? These are illustrations of the necessity of rest for those organs mainly under the control of the will.

Of those organic functions not under the control of the will, none are more marked than those which are absolutely essential to the maintenance of life—the circulation of the blood and respiration. While the circulation of the blood never wholly ceases from the beginning of life to the end, the heart, by which the blood is propelled, rests about one fourth of its time—between the beats. And the lungs, by which respiration is kept up every minute from birth until death, repose about one third of their time—between each inspiration and the succeeding expiration.

The stomach requires periods for recuperation after the process of digestion for greater or less length of time, depending upon the degree of labor it has performed; and after special derangement from unwholesome food or drink most persons have learned by experience to know special prolonged rest is required by the stomach to regain its accustomed strength. And so may be traced the periods of rest required by all the organs—none labor incessantly.

But more than all these, when, as a penalty for his disobedience, it was ordained that man should live by "the sweat of his face," the greatest of earthly blessings was left him as a reward for his labor—the blessing of rest in sleep; nature devoting her best efforts during this period to repair the ex-

hausted powers. That the Creator has implanted in man an endowment so beneficent as sleep, by which he is enabled to sustain his existence under the labor and vicissitudes inseparably connected with his living existence, is an evidence of His merciful love which should impress every thoughtful mind with a sense of its importance and significance.

Sleep is a synonym for mental rest—the period when the brain rests from the exercise of its functions, and the will-power reposes. Meanwhile the involuntary functions—the circulation of the blood, respiration, and nutrition ; and the secretions of the skin, liver, and kidneys—pursue their course. The organs by which these functions are performed all taking their periods of rest, however, with the same degree of regularity as when the brain is active, but with less disturbance and proportionally increased benefit.

Recreation is akin to rest, in so far as it affords complete relief from strain of the too continuous application of physical or mental energy in one direction. The division of the day into three periods of eight hours each, for labor, recreation, and rest, is found to be, by all practical observers, that which is most promotive of the best conditions of human welfare. And no matter what the occupation, if it is of a kind to exclusively employ the faculties in one direction for more than eight hours out of the twenty-four daily, the physical and mental powers will not only ultimately weary of that pursuit, if the overtax be persisted in, but they will become impaired for any other.

This division of time, however, for the ordinary staid pursuits of common life, is no criterion for school life.

The intensity of application common to the school-room bears no relation to the division of the day into three parts for the ordinary avocations of life—the teacher only bears that relation, or should, of not more than eight hours out of twenty-four daily for five days in the week. But the time of the pupils is divided into applications of thought of various degrees of intensity, which, taken in the aggregate, too often approaches the amount of pressure common to the stock board in minds much less able to bear it ; above all, in those seasons of cramming for the annual show familiarly known as "commencement day."

Half hourly divisions of time from one study or recitation to another, and each one requiring such intensity of application as will show competency in all, for periods of two hours or more without recreation, is more worthy the name of stunting the intellect than of educating it, and deserves the reprobation of every true friend of education. Children under ten years of age, if sent to school, should, under no circumstances, be confined to their seats and books for more than half of their time, in alternate periods, half hourly, between study and recreation; from eight to thirteen years of age, one third of the time, or half an hour after each hour's devotion to study; and for those who are older, never less than one fourth of the time should be devoted to recreation, and always, when weather will permit, out of doors.

Physical education should go hand-in-hand with mental education, for both sexes, and it is the more essential in the inverse ratio to the age of the pupil; and in all cases, where practicable, physical education should be taken in the open air.

It is too commonly the case, that physical exercise is looked upon as mere relief from mental exercise, and not regarded as it should be—as contributing to mental culture as well as bodily—increasing the vigor of the mind and promoting its power, and contributing to the strength and beauty of the body. There should be more frequent sessions, shorter periods of confinement to school-rooms, and more "play."

Professor Du Bois Reymond, of the University of Berlin, one of the pioneers and masters in modern physiology, has given the following admirable statement of the physiology of exercise. He says:

"By exercise we commonly understand the frequent repetition of a more or less complicated action of the body with the co-operation of the mind, or of an action of the mind alone, for the purpose of being able to perform it better. We seek in vain in most physiological text-books for instruction respecting exercise; if it is given, only the so-called bodily exercises are generally considered, and they are represented as merely exercises of the muscular system; therefore, it is not strange that laymen in medicine, professors of gymnastics, and school-teachers, generally believe that. Yet it is easy to show the error of this view and demonstrate that such bodily exercises

as gymnastics, fencing, swimming, riding, dancing, and skating are much more exercises of the central nervous system—of the brain and spinal marrow. It is true that these movements involve a certain degree of muscular power ; but we can conceive of a man with muscles like those of the Farnesian Hercules, who would yet be incompetent to stand or walk, to say nothing of his exerting more complicated movements.

"Thus it becomes clear, if proof were needed, that every action of our body as a motive apparatus depends not less, but more, upon the co-operation of the muscles than upon the force of their contraction. In order to execute a composite motion, like a leap, the muscles must begin to work in the proper order, and the energy of each one of them (in Helmholtz's sense) must increase, halt, and diminish according to a certain law, so that the result shall be the proper position of the limbs and the proper velocity of the centre of gravity in he proper direction. Since the nerves only transmit the impulses coming from the motor-ganglion cells, it is evident that the peculiar mechanism of the composite movements resides in the central nervous system, and that consequently exercise in such movements is really nothing else than exercise of the central nerve-system. This possesses the invaluable property that the series of movements, if we may speak thus, which take place in it, frequently, after a definite law, are readily repeated in the same order, with the same swell and ebb and intricacy, whenever a singly felt impulse of the will demands it. Thus all the bodily exercises we have mentioned above are not merely muscle gymnastics, but also, and that pre-eminently, nerve gymnastics, if for brevity we may apply the term nerves to the whole nervous system.

"Still, something else than the control of the muscles by the motor-nervous system comes into consideration in most composite movements. The sight, the sense of pressure, and the muscular sense, and finally the mind, must be prepared to take in the position of the body at each instant, so that the muscles may be in a proper state of adjustment ; this is plainly shown in the exercises of fencing, playing billiards, rope-dancing, vaulting on horses in motion, or leaping down a mountain slope. Thus not only the motor, but the sensor nervous system also, and the mental functions, are capable of being exer-

cised, and need it ; and the muscles again appear to acquire a deeper importance in gymnastics. What is said here of the coarser bodily movements applies equally to all skilled work of the highest as well as of the lowest kind." *

"The object of physical training with us," Professor Sargent of Harvard University observes, "is not to make men active and strong, as much as it is to make them healthy and enduring. Perfect health implies a condition in which all parts of the body are properly nourished and harmoniously developed—in which the vital organs are sound, well balanced, and capable of performing their functions to the fullest extent. The researches of the physiologists have shown that whenever a certain organ or class of organs becomes relatively too small or large, causing a want of balance or harmony in their action, there is in every case far greater liability to disease. It is in imperfect, ill-balanced organizations that we find the greatest amount of sickness, and the greatest number of incurable disorders. It is the weak spot, caused by inheritance, acquired by exposure, close confinement, overwork, etc., that invites disease and death, even though the rest of the system may be in perfect condition. To attain a perfect structure, harmony in development, and a well-balanced organism, is our principal aim.

"In order to go about our work intelligently, we first take a number of body measurements, which are compared with a standard for the given age. We then test the strength of various parts, examine the heart, lungs, etc., and solicit as much of the student's history as will throw light on his inherited tendencies. From the data thus obtained a course of exercise is prescribed which is in every way designed to meet the demands of his particular case. Let us take a few illustrations :

"No. 1 has a flat chest and is predisposed to consumption. If he is admitted to a gymnasium and left to his own discretion, the chances are that he will exhaust his vital energy in going from one thing to another before he has given his lungs and chest the special attention which they need. His wants are best subserved by specifying the work most suitable

* Quoted from "Circular of Information of the Bureau of Education," No. 5, 1885, p. 153.

for him, and by adopting the apparatus best adapted to his peculiar condition.

"No. 2 has a weak, irregular heart and poorly-developed back and legs. Systematic rowing and running at a slow pace are admirably adapted for toning up the heart and strengthening the muscles of the back and legs, and are prescribed as special exercises with limitations.

"No. 3 is nervous and excitable, inclined to do everything at a breakneck speed, thereby drawing upon the very power which it is for his interest to conserve. In this case a list of exercises is prescribed which are calculated to deaden nervous sensibility by increasing muscular strength.

"No. 4 is bilious or lymphatic, and is given the opposite course from that prescribed for No. 3; and so on.

"Where the muscular system only needs development, the pupil is directed at first to those appliances which are designed to strengthen his weak parts. After he has become more symmetrical his exercises are made more general. For the benefit of those who simply need exercise without special training, a number of appliances have been introduced, which are so constructed that they can be readily adjusted to the 'strength of the strong and the weakness of the weak.' No long instruction is needed to make this apparatus available. It is only necessary to explain the desired movements once, and the results which follow will tell how well they have been carried out. Besides the developing appliances we have a great variety of swings, bars, ladders, etc.; but before the student is allowed to use them he must give evidence of a certain amount of preparatory training.

"This, in short, is the system pursued at Harvard, where there is no systematic instruction, and where, after an order of exercises has been once prescribed, everything is left to the option of the student. How well the system works may be learned from the inspection of the gymnasium records, which are always open to the public. The second examinations show results which are very suggestive, if not a little startling. They have led me to conclude that half the young men who come to college are physically in arrears—*i.e.*, their brains have been developed at the expense of their physique. The rapid gain in health, strength, and size of students and pro-

fessors (though more advanced in years) during the first three or four months of their gymnastic training can only be accounted for on this ground. Our best scholars fail for want of body, not for want of brain." *

Of the various kinds of recreation and amusement, of which there is no lack, there seems to but little need to particularize, farther than to state that whenever practicable they should be in the open air.

With regard to the relative advantages of *gymnastics* and *military exercise*, the writer regards both for healthy subjects as inferior to the common sports of school-life—base-ball, foot-ball, cricket, running, rowing, skating, and the like. Military drill is useful in conjunction with outside sports and gymnastics, but it never should take the place of them. It is too much of a study and too constrained to compare with sports of any kind, and decidedly inferior to the far more versatile and shifting positions of gymnastics.

For girls : Croquet, lawn tennis, ball throwing and catching, and skating, possess advantages altogether superior to common indoor gymnastics—which might wisely be left for use in bad weather ; always provided that the ventilation of the gymnasium receives special attention.

"Throughout childhood and youth growth is the dominant requirement, to which all other requirements should be subordinate. A requirement which indicates the giving of much and the taking away of little—a requirement which therefore restricts the exertion of body and mind to a degree proportionate to the rapidity of growth—a requirement which permits the mental and physical activity to increase only as fast as the rate of growth diminishes.

"In primitive times, when aggression and strength were the leading social activities, bodily vigor, with its accompanying courage, were the desiderata ; and then education was almost wholly physical ; mental cultivation was little cared for and indeed, as in our feudal ages, was often treated with contempt. But now that our state is relatively peaceful—now that muscular power is of use for little else than manual labor, while social success of every kind depends very much on men-

* "Circular of Information," etc., just before cited, p. 46.

tal power, our education has become almost exclusively mental. Instead of respecting the body and ignoring the mind, we now respect the mind and ignore the body. We do not yet sufficiently realize the truth that as in this life of ours the physical underlies the mental, the mental must not be developed at the expense of the physical. The ancient and modern conceptions must be combined. Perhaps nothing will so much hasten the time when body and mind will both be adequately cared for, as a diffusion of the belief that the preservation of health is a *duty*. . . . All breaches of the laws of health are *physical sins.* When this is generally seen, then, and perhaps not till then, will the physical training of the young receive all the attention it deserves." *

Of *Discipline.*—Hiram Orcutt, LL.D., in a communication addressed to the Commissioner of Education, and issued as a circular from the Commissioner's office in 1877, remarks :

"That teacher alone who loves his pupils has power to gain their love and confidence, which should be his chief reliance in school management. An affectionate pupil will confide in our judgment, respect our authority, and fear our displeasure. If we show him by our personal attention and kindness that we are his true friends and that all our efforts are designed to secure his best good and make him believe it, we hold him as by the power of enchantment ; we have no further need of physical force as applied to him. He is held under another and higher law, which induces him to gratify our wishes and seek the best good of our school. We, as teachers, occupy for the time being the place of the parent, and we should, as far as possible, cherish the affection and manifest the interest and zeal of the true mother, who spends her life in loving and toiling for her children. But this kindness, which is an essential element in every true system of government, is not, and cannot be, a substitute for authority or an obstacle to severity, when the good of the individual or the school demands it. The teacher must cherish an abiding love for his pupils, and that love is never more truly exercised than in inflicting necessary pain in the management of public affairs. Of the teacher's heart Shakespeare could not say, 'It is too full of

* Herbert Spencer, op. cit.

the milk of human kindness,' if only he has enough of authority, firmness, and executive will. Without these, even love as an element of school discipline is sometimes powerless.

"Wholesome laws will be violated under every system of school management. The question to be settled is, Should the government of the school be positive and efficient? If so, the master must have the right, disposition, and power to inflict punishment when necessary. If this right is denied or this power withheld, the government of the school is at the mercy of circumstances; it cannot be sustained. In the dispensation of penalties, professional knowledge and wise discrimination are requisite. The circumstances connected with the offence must be carefully studied and a distinction always made between wilful and unintentional wrong. The isolated act of transgression does not indicate the degree of guilt incurred nor the kind of punishment to be inflicted; the presence or absence of palliating circumstances, the motives which generated the act, the present views and feeling of the offending pupil, must *all* be taken into account. The master should never, therefore, threaten a specific punishment for anticipated offences. No two cases of transgression will be exactly alike, and hence the kind and degree of punishment should be varied as the case demands. But the good disciplinarian seldom resorts to severe punishment in the government of his school; yet he never relinquishes his right to punish as circumstances require. Nor does he regard severity, when necessary, as an evil to be deplored. It is, indeed, a sore evil that mortification has so endangered the life of the patient that the limb must be amputated; but it is not an evil that you have at hand surgical skill and suitable instruments to perform an operation. It is, indeed, a misfortune that any child or pupil has become so demoralized and reckless as to incur the penalties of the law; but Solomon's rod, which has restored him to obedience and duty, is a blessing whose influence will be felt and acknowledged by the offender as long as he lives.

"Nor is severe punishment to be regarded as the 'last resort.' When it may be inflicted at all, it is the first resort, and the true remedy. Allow me to illustrate: A skilful physician is called to prescribe for a patient sick almost unto death. He sees, at a glance, that only one remedy will cure,

and that must be administered promptly. Now the question is, Shall that powerful medicine be given at once or as 'the last resort,' after every mild remedy has failed? If the doctor resorts to herb drink and tonics in the case supposed he is a quack, and his patient will die while the tender-hearted simpleton is experimenting upon him. But the '*calomel*' is given and the patient recovers. So with punishment. It may be mild or severe; each kind is appropriate as a remedy for specific evils. But if the case is one that requires great severity, that kind of punishment must be inflicted promptly and faithfully. 'Spare the rod and spoil the child,' under such circumstances. Much has been said and written upon corporal punishment and moral suasion, but their appropriate use in school discipline is seldom understood, as it seems to me.

"Moral suasion is not the remedy for bold and defiant violations of law, if we mean by that term the persuading of the culprit to return to obedience or the purchase of his allegiance by a promised reward. Rebellion should be met by stunning, crushing blows, such as will vindicate and re-establish authority and deter others from committing the same crime. Mildness is cruelty under such circumstances. All such cases demand instant and determined action. The time for conciliation is after the rebels are subjugated and the authority of the government is restored. But moral influence and kindness should attend every act of severity; never let the sun go down upon the wrath of a chastized pupil. See him alone, bring to bear upon him every moral power, treat him now with kindness and confidence, and thus restore him to duty and favor. Without the rod moral suasion might have been powerless, or, if successful, what was gained by persuasion was lost to authority. It must never be doubtful that the master has supreme control over his little kingdom. If his authority is trifled with it must be restored without delay, and any punishment is judicious that is necessary to this end. The system of government here recommended does not offer an angry word or blow for every offence, rèal or fancied. The best masters, who have adopted it, punish the least. And when severe punishment becomes necessary, the pupil is made to believe that a sense of duty, and not passion, nerves the arm to strike the blow. He is made to understand that it is the master's

duty to command and the pupil's duty to obey. Practically, the system of government based upon authority has alone been successful ; every system that has abandoned the right or lost the power to punish has proved a failure.

"The discipline of *good manners*, which our fathers seem to have regarded of great importance, has been fearfully neglected in these latter days. As a consequence, our children in the family and school practice only rudeness and insubordination. To such an extent has this department of education been neglected of late in our country that we have received merited reproach from other nations. We may here draw the contrast between the old and new civilization. The old was distinguished by a proper regard for all the courtesies of refined life ; the new can boast of nothing but incivility. The rapid decline of good manners in our time appears most evident when we compare the practice of our fathers with their degenerate grandchildren. The old civilization recognized the 'bow' and 'courtesy' as tokens of respect. They have ever been so regarded, though sometimes used as mere signs of recognition. In the rural districts the bow and courtesy have been regarded as evidence of good breeding and as the expression of proper reverence cherished by the young for their superiors. Alas ! that the sign and the thing signified have nearly passed away.

"Children left to their own ways grow up in the entire disregard of common courtesy. They neglect to show proper respect to parents and teachers, to seniors in age, and to superiors in station, wisdom, and virtue. And if the ordinary civilities of refined life are not regarded in the family and school and in the social intercourse of home society, how can we expect that politeness will be extended to the stranger met in the marts of business or in the walks of pleasure? In the present condition of society, much responsibility in regard to the needed reform rests upon the teachers of our public schools. And the only way to accomplish the desired object is by earnest self-culture and faithful instruction on the part of the teachers of the nation and those who are candidates for that responsible office."

In addition to the above, it may be remarked that while corporal punishment in school has rightly come to be looked

upon as disgraceful, and the more to the *teacher*, if exercised on the plea that the pupil does not so regard it on account of home surroundings, *detention from play* or *keeping-in after hours* appears to be practised with but little reflection upon its galling effects and unhealthful tendencies. Indeed, it seems to this writer that teachers and others who favor the keeping-in system must be very superficial observers of children not to have learned that to *deprive a child of play* is an exceedingly poignant punishment ; one that afflicts and grieves his mind not only, but frequently stirs up his worst passions. Besides, keeping-in is frequently coupled with an extra task or "till the lesson is got." Surely, nothing could be better calculated to create a repugnance to study and stimulate obstinacy. Moreover, it sometimes involves the loss of a meal, or, at least, a postponement of meal-time, to the derangement of digestion and injury of health. In every attitude of the case the system of keeping-in as a punishment is bad—worse even than corporal punishment, and, like it, should never be practised except in extreme cases. Discipline is most effectually exercised by those teachers who have the faculty of winning the love of their pupils ; by those who have the judgment and tact of appealing to and touching the sensibilities of children, and by kind words of encouragement stirring up a self-consciousness of their capabilities in contrast with opposite conditions. Children are quick to learn by careful tutelage the advantage of the good opinion and love of their teachers, insomuch that the mere suspicion of abatement or power on their own part to attract *some* meritorious notice touches and arouses sensibilities which, in their results, have no comparison with the debasing means which it is the purpose of this paragraph to condemn. In short, the pains opposed to the pleasure of self-esteem and praise are the weapons above all others the most effectual in the maintenance of discipline.

(*To be continued.*)

THE AMERICAN ACADEMY OF MEDICINE is endeavoring to make as complete a list as possible of the Alumni of Literary Colleges in the United States and Canada, who have received the degree of M.D. All recipients of both degrees, literary and medical, are requested to forward their names at once to Dr. R. J. Dunglison, Secretary, Philadelphia, Pa.

THE MEDALS, JETONS, AND TOKENS ILLUSTRATIVE OF SANITATION.

By Dr. HORATIO R. STORER, Newport, R. I., Member of American Public Health Association, etc.

X. *Epidemics.* Continued from page 253.*

SINCE my last chapter, I have discovered another famine piece, of Flanders in 1587. Though semi-political, it is also interesting in connection with The Plague series.

466[a]. Obverse. A Spaniard, between the personifications of Famine and The Plague. Legend : Multa. Sunt. Mala. Impiorum.—1587.

Reverse. A cornucopeia, with fruit and ears of grain. Legend : Qui. Dno (Domino). Fidit. Bonitate. Eius. Circumdabitur.

Du Rosey Cat., Leipsic, 1863, p. 172, No. 1344.

Unknown to P. and R.

I have also learned of the four following additional cholera medals.

1019[a]. Struck by the authorities of Amiens, France, in 1866, with device the city arms. It was conferred upon Dr. O'Donnell Challier de Grands Champs (*Boston Pilot*, August 3d, 1889, p. 8). This was unknown to P. and R.

1027[a]. I have described two medals of Sts. Roch and Hubert, Nos. 1026–27, which were Nos. 453–4 of P. and R. The obverse of the present is the reverse of the former, muled with reverse of the latter. Oval. Edges scolloped. 12×14. Probably struck in Paris. It is in the collection of Mr. David L. Walter, of New York, from whom I have impressions. This was also unknown to P. and R.

1027[b]. The devices much as in last, save that in this, St. Hubert is at right of the stag, while in that he is at left. In

* The previous portions of this paper will be found in THE SANITARIAN for May, July, August, October, 1887 ; February, April, July, August, November, 1888 ; February, March, April, June and September, 1889.

both exergues a minute cross. The inscription of obverse nearly touches the ground at each extremity. The hand of St. Roch reaches above Du.

Oval. Edges regular. 12.5 × 14.5. Brass.

1027[c]. As the preceding, save that the inscription of obverse (St. Roch) is higher from the ground, while that of reverse extends lower. St. Roch's hand points below Du.

Both of these last are in my collection, from Mr. R. W. McLachlan, of Montreal, to whom I owe a great many favors. They were unknown to P. and R. Though undoubtedly struck in France, and bearing the word Cholera, they were sold in Montreal during the recent *small-pox* epidemic.

Besides the Yellow-Fever medals mentioned in the June number, there is an English one apparently as yet undescribed.

1066[a]. Gold, accompanying the "Parkes" Triennial Prize of £100. That for the present year was awarded to Surgeon Firth of the Army Medical Staff, for an essay upon "The Etiology and Prevention of Yellow Fever." (THE SANITARIAN, August, 1889, p. 170.)

Under Scarlet Fever, in the June number, one of the medals of Hahnemann, our No. 1132, has Cur*e*ntur, and not Curantur, as there given.

XV. VENEREAL DISEASES.

A. THE UNITED STATES.

Dr. J. M. Toner, of Washington. "The Question of the American Origin of Syphilis."

Address before Rocky Mountain Medical Association, Washington, 1877. Already described in several connections.

B. GREAT BRITAIN.

Dr. Robert Barker. "Practical Observations on the Gonorrhœa virulenta." Oxford, 1801, 8°.

1140. Obverse. Head to right. Beneath, A. Dassier F. Inscription : Robertus — Barker.

Reverse. A scrolled shield, surmounted by a female head, and fillet. Beneath, the head of Æsculapius, entwined by two serpents. On either side, a palm branch. In field : Doc-

tor Medicus | Socius Regiae Societ. | Londinensis | MDCCLXIV. Bronze. 35. 53 mm.

Poulharies has F. Dassier. Kluyskens and Duisburg have date in Roman numerals, and the latter a dot before it.

Moehsen, i., p. 344, fig.; Gaetani, ii., p. 341, pl. 184, No. 4; Snelling, pl. 31, No. 2; Poulharies, Hist. Mét., p. 226; Rudolphi, 1829, p. 11, No. 44; Kluyskens, i., p. 62; Duisburg, p. 222, dlxxxviii. In the Lee Collection.

Dr. Richard Carmichael (1779–1849). "Observations on the Symptoms and Specific Distinctions of Venereal Diseases," etc. London, 1818, 8°.

1141. Award medal of "School of Anatomy." 24.

Wood Catalogue, February 25th–29th, 1884, No. 2276.

Unknown to Rudolphi, Kluyskens, Duisburg, and Rüppell, and I fail to find it anywhere described.

Dr. Peter Clare (–1784). "A New and Easy Method of Treating the Lues Venerea." London, 1780, 8°.

1142. Obverse. Bust, to right. Beneath, T. Holloway Fec. Inscription: Petrus Clare. Lond. Chirurg. Soc.

Reverse. Artem Medendi Remed. Ore Ȧbsorpt. Inv[t]. Et Divulg[t]. A.D. 1779. Bronze. 20. 30 mm.

In the Wood Catalogue, February 25th–29th, 1884, No. 2278, there is given on the reverse, Memendi.

Knorre, p. 97, No. 888; Rudolphi, 1829, p. 35, No. 137; Kluyskens, i., p. 200; Duisburg, p. 225, dxcviii. In the Lee Collection.

Dr. John Hunter (1728–93 [1798, Rudolphi]). "Treatise on the Venereal Disease." London, 1786, 4°; 1788.

1143. Obverse. Bust. Beneath, B. Wyon. Inscription: Johannes Hunter.

Reverse. A laurel crown, beneath which: A.D. 1831.—Ins(tituta). Inscription: Schola Medicinae Leodinensis (of Leeds). Duisburg wrongly has Londinensis.

Duisburg, Suppl., i., 1863, p. 13; Rüppell, 1875, p. 80.

In the British Museum. Unknown to Rudolphi and Kluyskens.

1144. Obverse. The conjoined heads of Drs. Hunter and George Fordyce, to left. Beneath the shoulder of the outer one, J. Milton F. Inscription: Georgivs·Fordyce·Et·Joannes Hunter·Patroni.

Reverse. A serpent erect, shedding its skin. Legend: Renovando-Viget. Beneath: Lyceum Medicvm. J. M. F. Tower. Bronze. 42 m. Kluyskens omits the F. before Tower.

Rudolphi, p. 55, No. 225; Kluyskens, i., p. 312, fig.; Duisburg, p. 228, dcv.

1145. The gold "Copley" medal of the Royal Society of London, conferred in 1787. I have already described this in my paper upon the medals, etc., illustrative of Midwifery and the Diseases of Women.

Weld. History of Royal Society, London, 1858, 8°, p. 79. Dr. Hunter will be again referred to in Section XI.

Dr. Thomas Sydenham, of London. "On the Lues Venerea." 1680. Already referred to in the present Section, under General Epidemics, The Plague, Small-Pox, and Intermittent.

C. Holland.

Dr. Herman Boerhaave, of Leyden (1668–1738). "Tractatio medico-practica de lue venerea." Leyden, 1751, 12°.

1146. Obverse. Aged bust, to right. Beneath: A. Bemme. Inscription: Hermannus Boerhaave.

Reverse. Staff of Æsculapius, with branch of olive, encircled by a wreath. Below: Geboren | Te Voorburg | MDCLXVIII. | Overleden | Te Leyden | MDCCXXXVIII. Bronze, tin. 50 mm.

Rudolphi, Kluyskens, and Duisburg have dates in Roman numerals.

Van Loon, cont. ii., pl. 14, No. 130; Rudolphi, 1829, p. 22, No. 81; Kluyskens, i., p. 138, No. 1, fig.; Duisburg, p. 180, cccclxxxvi, 1.

1147. Obverse. Bust to left. Beneath, Simon F. Inscription: Herman Boerhaave.

Reverse. Inscription: Natus 1668 Prope Leidam. Mortuus 1738. Bronze. 45 mm.

Rudolphi has dot after the first date, but not after Leidam. Kluyskens also omits this latter.

Van Loon, ii., pl. 14, No. 129; Rudolphi, 1829, p. 22, No. 82; Kluyskens, p. 138, No. 2; Duisburg, p. 180, cccclxxxvi., 2. In the Fisher Collection.

1148. Obverse. Bust, to left. Beneath, Vivier F. Inscription : Hermannus Boerhaave.

Reverse. Natus Vorzouti Prope Leidam In Hollandia An. MDCLXVIII. Obiit An. MDCCXXXVIII.—Series Numismatica Universalis Virorum Illustrium. MDCCCXIX.—Durand Edidit. Bronze, 40 mm.

Kluyskens has Voozouti, and both he and Duisburg have the dates in Roman.

Van Loon, ii., pl. 14, No. 131 ; Kluyskens, i., p. 139 ; Duisburg, p. 181, ccccLxxxvi., No. 3. Unknown to Rudolphi.

1149. Obverse and reverse as preceding, save in exergue of latter, MDCCCXXI. Bronze. 40 mm.

Both Rudolphi and Duisburg have the dates in Roman.

Van Loon, ii., pl. 14, No. 129 ; Rudolphi, 1829, p. 22, No. 83 ; Duisburg, p. 181, cccclxxxvi., No. 3. In the Fisher Collection and my own.

1150. Obverse. Bust, to left. Inscription : Herman Boerhaave Geb. 31. Dec. 1668. Overl. 23 Sept. 1738.

Reverse. Statue facing, head to left. Inscription : Onthuld Te Leiden den 26. Juni 1872. Beneath : J. T. Stracké Sc.—J. P. V. d. Kellen F. Bronze. 34. Rüppell, 1876, p. 9.

In the cabinet of Dr. Toner, of Washington, who has kindly loaned it to me for inspection. It commemorates the erection of Boerhaave's monument at Leyden.

1151. Obverse. Bust, facing. Beneath : H. Boerhaave.

Reverse plain. Die cut by K. Lanting, of Amsterdam. Silver. Oval. 85 mm.

Van Loon, ii., p. 129, pl. 14, No. 132 ; Rudolphi, 1829, p. 22, No. 84 ; Kluyskens, i., p. 139, No. 4 ; Duisburg, p. 181, cccclxxvi., 4.

Conjointly with others, Boerhaave is also honored by the following.

1152. Obverse. Bust of the Belgian King, to the left. Beneath, Braemt F. Inscription : Guilielmus I - Belgarum Rex.

Reverse. In field : Societas Regia Horticulturae Belgii Bruxellis Around this, a garland of flowers and fruits, interlaced with which, upon the uniting band : Dodonaeus, Lobel, Jacquin, Boerhaave, Rumphius, Rheede, Clusius. Bronze. 50 mm. Kluyskens, ii., p. 146. Unknown to Rudolphi and Duisburg.

D. Belgium.

Dr. A. P. Burggraeve, of Ghent. "La Nature des Maladies Syphilitiques." Ghent, 1828.

Previously described under Section I. Dr. B. has also been mentioned in the present Section, under Vaccination and Cholera, and will be again under Section XII., Climate.

E. Sweden.

Dr. Pehr Dubb, of Gothenburg. "Nonnulla circa methodum luis venereae curandae meditamenta." Upsala (1777), 4°. Already described in the present Section, under Yellow Fever.

F. France.

Dr. Jean B. Astruc (1684–1766). "De morbis venereis." 1736.

1153. Described in my paper upon the medals, etc., of Midwifery and the Diseases of Women. Silver, gilt bronze. 30 mm.

Hauschild, Beitrag zur neuern Munz- und Med. geschichte, Append., No. 478; Kluyskens, ii., p. 144; Duisburg, p. 85.

Struck in 1746 while De L'Épine was Dean of the University of Paris. Very rare. The specimen which belonged to Dr. Chéreau, of Paris, is now in my collection.

Dr. H. T. Baron, Sr. "Si c'est aux médecins qu'il appartient de traiter les maladies vénériennes."

His jetons, also of the Parisian decanal series, have already been described under Section VIII., Diet.

Dr. Edmond Claude Bourru (1741–1823), Dean of the Parisian Faculty from 1786 to 1790. "L'Art de se traiter dans les maladies vénériennes." Paris, 1770, 12°.

1154. Obverse. Bust, to left, with wig. Beneath, Du Vivier. Inscription: Edm.Cl.Bourru Paris.Fac.Medic.Par.Decan.

Reverse. A seated female grasping the hand of another, standing, who holds fasces. Upon the square pedestal on which the former sits, D(u). V(ivier). Legend: Concordia Et Constantia Vincent. Exergue: 1786–87. Silver, silvered copper, gilt bronze. 19. 25 mm.

Rudolphi has Duvivier as one word upon the obverse, omits the dot after Fac, and has Med. Kluyskens has Duviv., and

Med. Duisburg has Du Viv. They all describe the D. V. upon the reverse as at the feet of the seated figure, whereas it is far distant, at the extreme right.

Rudolphi, 1829, p. 25, No. 95; Kluyskens, i., p. 149, No. 1; Duisburg, p. 90, cclix., No. 1. In the Lee Collection, and in my own from that of Dr. Chéreau.

1155. Obverse as preceding.

Reverse. Inscription: Edm.Cl.Bourru Paris. Sal. Fac. Par. Decano 1787, 88. In field, within a circle open below: Lectiones | Public. Gall. Idiom. | De Anatom. Et Chirur. | In Scholis Medic. Par. | Institutae | Ex Liberalitate | Cl.M.A. Petit | MDCCLXXXXVII. Bronze, gilt bronze. 19.

Rudolphi, Kluyskens, and Neumann have Du Viv. The two first and Duisburg have the date in the field of reverse in Roman numerals. Neumann has Decan°, omits the dot after Idiom, and has Med.

Rudolphi, 1829, p. 25, No. 96; Kluyskens, i., p. 149, No. 2; Duisburg, p. 90, cclix., No. 2; Neumann, No. 31,221. In the Lee Collection and my own.

1156. Obverse as preceding.

Reverse. Inscription: Hujus Filium | A Sal. Fac. P. Ad Sac. | Bapt. Fontes Oblatum | Cl. Felic. Hippocratem | M. Fr. Felicit. Cochu | Schol. Pene Antiquior | Nominavit | Die XI. Sept. | MDCCXC. Exergue: It. El. 1788. Conf., 1789. Tin. 19.

Duisburg has the dates in field of reverse in Roman numerals. Duisburg, p. 90, cclix., No. 3.

This was unknown to Rudolphi and Kluyskens. In the Chéreau Collection, now my own, it is represented only by a cast.

1157. Obverse and reverse as preceding, save in exergue of the former, Du Viv.

There is in my collection, from that of Dr. Chéreau, a cast of this. The abbreviation of the engraver's name is sharp and distinct, followed by as plain a dot, showing that similar obverses of the two preceding very probably also exist.

1158. Obverse as preceding.

Reverse. The family coat of arms; a crowned shield, adorned above with twigs, and bearing six rhombs. Upon either side, emerging lions. Exergue: 1787-88. Gilt bronze. 19. Duisburg, Suppl. I, 1863, p. 6.

This was unknown to Rudolphi and Kluyskens. Formerly in the Chéreau Collection, it is now in my own.

1159. Obverse as preceding.

Reverse. The Arms of the Faculty; three storks, to left, with sprigs of origanum, beneath a blazing sun. Legend: Urbi Et Orbi Salus. Gilt bronze. 19.

This was unknown to Rudolphi, Kluyskens, Duisburg, and Rüppell. It was in the Chéreau Collection, and is now in my own.

Dr. Jean Fernel (1497 [1496, Index Cat. S.-G. O.]–1558). "Le meilleur traitement du mal vénérien." 1579, 8°.

1160. Obverse. Bust, to left. Beneath, De Paulis F. Inscription: Jean Fernel.

Reverse. Né A Clermont Près Beauvais En MCCCCXCVII. Mort En MDLVIII. Galerie Metallique Des Grands Hommes Français. 1822. Bronze. 26. 40 mm.

Rudolphi, by a glaring error, states the year of death as 1658. He, Kluyskens, and Duisburg have the dates of birth and death in Roman numerals.

Rudolphi, 1829, p. 52, No. 211; Kluyskens, i., p. 301, No. 1; Duisburg, p. 42, cxvi., No. 1. In the Lee and Fisher Collections.

1161. Obverse. Two busts, side by side, to right; one with cap. Behind: Gatteaux. Inscription: Jean Fernel. Ambroise Paré. Exergue: La Medecine Rendue A Son | Unité Primitive | Décret Du 14 Frimaire | An III De La R(epublique). F(rançaise).

Reverse. Inscription: École De Médecine De Paris. In field: Prix | De L'École | Pratique | An VI. Exergue: Staff of Æsculapius and serpent, prone, to right. Bronze. 38. 60 mm.

Rudolphi and Duisburg have Frimaire, and a dot after III. In the inscription of reverse, Duisburg has De La.

Cat. des poinçons, etc., p. 314, No. 24; Hist. Mét. Napol., pl. 28, No. 193; Hennin, pl. 87, No. 862; Rudolphi, 1829, p. 52, No. 212; Kluyskens, i., p. 301, No. 2; Duisburg, p. 42, cxvi., No. 2. This is in my collection.

1162. Obverse as preceding.

Reverse. An open court, surrounded on three sides by a building; a façade in centre, clouds above. Beneath, to left,

N. Gatteaux. F. Inscription: Aedes Academi. Et Scho. Chirurgo(rum). Exergue: Regia Mvnificentia Inchoat | MDCCLXX Absol: | MDCCLXXIV. Bronze. 38.

Rudolphi inserts Et after Aedes, and has Academiae and Scholae, and, with Duisburg, has but one dot after Absol, while in Kluyskens' figure there are none. They all have the dates in Roman.

Cat. des poinçons, etc., p. 312, No. 17; Hennin, pl. 64, Nos. 642–3 (the latter but slightly varying); Rudolphi, 1829, p. 52, No. 213; Kluyskens, i., p. 302, No. 3, fig.; Duisburg, p. 42, cxvi., No. 3; Snowden, Medallic Memorials of Washington in United States Mint (Misc. medals), p. 129, No. 45.

This medal commemorates the organization of the three schools at Paris, Montpellier, and Strasburg. It is in the United States Mint Collection, the Lee, Fisher, and my own. The reverse is similar to that of a medal of Louis XVI., by Du Vivier, which is in the Lee Collection.

Dr. Denys Laffecteur, of Paris. "Obversations sur les effets du rob * anti-syphilitique." Paris, 1785, 8°.

Dr. Boyveau-Laffecteur.

"Précis historique et observations sur les effets du rob anti-syphilitique." Paris, 1843, 12°.

This was probably the son of the preceding, who it will be perceived was already in possession of the formula known by the family name, which was long recognized as legitimate by the French profession. As it now seems to have become an ordinary proprietary nostrum, its medals and tokens will be considered a little later on.

Dr. Étienne Lanthois (1767–1826 [these dates not given in the Index Cat. of the Surgeon-General's Office]). "Nouvelle théorie sur les maladies vénériennes." Paris, 1822, 8°.

1163. Obverse. Bust. Beneath, N. P. Tiolier F. Inscription: Etienne Lanthois Bienfaiteur De L'Humanité.

Reverse. An altar; upon it a patera from which the serpent of Æsculapius, twined around his staff, is drinking. To left, a palm leaf; to right, a wreath. Inscription: Hygie Et

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* "A *rob* is an extract of the juices of fruit. Those of elder (Sambucus) and of buckthorn (Rhamnus) are the only ones (officinally) employed." Trousseau and Reveil. The Prescriber's Complete Handbook. Edited by Nevins. London, 1852, p. 164.

Le Reconnaissance L'Ont Décernée. Exergue : Offerte Par F. T. Belanger. 7 BR. 1817. Bronze. 45 mm.

Kluyskens describes the palm as a feather.

Lanthois, Phthisie pulmonaire, Paris, 1822, figure on frontispiece ; Rudolphi, 1829, p. 89, No. 373 ; Kluyskens, ii., p. 122 ; Duisburg, p. 66, clxvii., No. 1. In the Fisher Collection.

1164. Obverse as preceding.

Reverse. Inscription : Né A Marseille En 1734. Mort En 1826.—1828. Bronze. 45 mm.

Duisburg, p. 66, clxvii., No. 2.

This reverse seems to belong to another medal entirely. The date of birth is erroneous, and it has, perhaps accidentally, been muled with the obverse of Lanthois. The medal was unknown to Rudolphi and Kluyskens.

Dr. Louis Pierre Félix René Le Thieullier, Dean of the University of Paris from 1768 to 1774. "An per suffitum felicior et tutior quam per inunctionem mercurialem morbi venerei curati?" (Paris, 1752.)

1165. Obverse. Bust, to left. Beneath, Roettiers Filius. Inscription : L.P.F.R.Le Thieullier Paris F.M.P.Decanus.

Reverse. Coat of Arms. Exergue : Two academic sceptres, crossed, upon a cushion. 1770. Beneath, 1768–69. Silver, gilt bronze. 26 mm.

Kluyskens and Duisburg wrongly have a dot after Paris.

Rudolphi, 1829, p. 158, No. 655 ; Kluyskens, ii., p. 149, No. 1 ; Duisburg, p. 88, cclii., No. 1.

I have already referred to the reverse of this jeton when describing that of Dr. J. B. N. Boyer, No. 706, in the present Section, under General Epidemics.

1166. Obverse as preceding.

Reverse. In field : Chemiae | Curs. Institut. | 1770 | Inaugur. | M.Aug.Roux | 1771 At margin, upon three bands, separated from each other by fleurs-de-lis within circles : Electus 1768—Confirm. 1770—Iter.Elect.1772. Gilt bronze. 19. 26 mm.

Rudolphi, Kluyskens, and Duisburg wrongly have dots after all the dates on reverse.

Rudolphi, 1829, p. 158, No. 656 ; Kluyskens, ii., p. 149, No. 2 ; Duisburg, p. 88, cclii., No. 2. This is in my collection, from that of Dr. Chéreau.

G. Germany.

Dr. Johann Daniel Major (1634 [1654, Rudolphi]–1693). "De usu et abusu mercurii in lue venerea." Kiliae (1673), 4°.

1167. Obverse. Fame holding in each hand a trumpet and seated upon a globe. On this, I D M(ajor) 1688. Inscription : In Cimbrici Musei Memoriam.

Reverse. The Museum at Gottorp, surmounted by an eagle with a shield, upon which C. A. (the Duke Christian Albrecht, its benefactor). In front, a fallen vase, discharging coins and a book ; to left, a bust of Jupiter Ammon and a sphere ; to right, bust of Minerva, and an owl. Legend : Physis — Protectio — Techne — Antiquitas. Bronze. 47 mm.

Tenzel, Monatl. Unterred. Dec., 1697, p. 1005 ; Koehler, xx., p. 89 ; Rudolphi, 1829, p. 98, No. 416 ; Kluyskens, ii., p. 179 ; Duisburg, p. 114, cccvi. ; Renauldin, p. 310 ; Durand, p. 122.

Dr. R. Virchow, of Berlin. "Ueber die Natur der constitutionall-syphilitischen Affectionen." Berlin, 1859.

Already described under Section IX., Famine, and in the present, Typhoid ; and will be again mentioned under Leprosy, and in Section XI., Military Hygiene.

H. Italy.

Dr. Girolamo Fracastorio (1483–1553). "Syphilis sive Morbus Gallicus" (a poem). Verona, 1530, 4°.

1168. Obverse. Head nude, with short hair and crisp beard. Inscription : Girolamo Fracastorio.

Reverse plain. 100 mm.

Cicognara, ii., pl. 51, No. 2 ; Rudolphi, 1829, p. 56, No. 228 ; Kluyskens, i., p. 318, No. 1 ; Duisburg, p. 8, xviii., No. 1 ; Armand, i., p. 181, No. 15.

Considered by Armand, upon Cicognara's authority, to be the work of G. Canino, of Padua, though it is not mentioned by R. H. Lawrence ("The Medals of Giovanni Canino, the Paduan." N. Y., 1883).

1169. Obverse. Bust, to left. Inscription : Hieronymvs· Fracastorivs·

Reverse. A burning altar, beneath which a serpent's head. On either side, an open book and globe, a lyre and laurel

branch. Legend : Minervae. Apoll. Et. Aescvlap. Sacrvm. Cast iron, bronze. 63 mm.

Duisburg has a comma after Minervae. Rudolphi and Kluyskens omit the dots after both this and Et. Duisburg omits the latter of these.

Maffei, ii., p. 337 ; Koehler, v., p. 177 ; Gaetani, i., p. 281, pl. 61, No. 4 ; Rudolphi, 1829, p. 56, No. 229 ; Kluyskens, i., p. 318, No. 2 ; Duisburg, p. 8, xviii., No. 2 ; Armand, i., p. 131, No. 7.

This medal is the work of Giulio della Torre, of Verona.

1170. Obverse as preceding.

Reverse. Bust of "Petrus Grossus." Bronze.

I find no published description of this medal, but in the MS. notes by Friedländer in my possession this eminent numismatist distinctly states that it was in his collection.

1171. Obverse. Three busts. Beneath the first, F. P(utinati). In. Inscription : Catvllvs. Mapheivs. Fracastorivs. Exergue : 1806.

Reverse. Minerva, with History seated near, extends a laurel wreath to a youth. Legend : Sertvm Colenti. Beneath, Dr. Dr. Bronze. 43 mm.

Rudolphi and Kluyskens have 1805, but Millin, 1806.

Millin, Suppl. Hist. Mét. Nap., pl. 68, No. 440 ; Rudolphi, 1829, p. 56, No. 230 ; Kluyskens, i., p. 319, No. 3 ; Duisburg, p. 8, xviii., No. 3.

1172. Obverse. Bust. Beneath, Nic. Cerbara Fec. Inscription : Hieronymus Fracastorius.

Reverse. Serpents entwined in a laurel wreath. Legend : Poemate Aegris Amimis Pharmaco Corporib. Scientissime Propinato. Bronze. 26.

Duisburg, Suppl. I., 1863, p. 1. In the Lee Collection. Unknown to Rudolphi and Kluyskens.

Dr. Domenico De' Leoni. Professor at Bologna from 1559–88.

1173. Obverse. Bust, with head bare, to left. Behind, a star. Inscription, divided by leaves and a scroll : Dominicvs — De — Leonibus.

Reverse. Upon a low column, a vase with beak and handle. Legend, divided by leaves : XIC — Est — Vasus — Amoris Bronze. 40 mm.

Gaetani, i., p. 422, pl. 95, No. 3 ; Rudolphi, 1829, p. 93,

No. 393; Kluyskens, ii., p. 142; Duisburg, p. 12, xxi.; Armand, ii., p. 270, No. 15.

1174. Obverse. Bust, head covered, to left. Inscription: Dominicvs . De . Leonibus.

Reverse plain. 48 mm. Armand, ii., p. 270, No. 16.

In the British Museum. Unknown to Gaetani, Rudolphi, Kluyskens, and Duisburg.

Dr. Nicolo Massa, of Venice (-1569 [1563, Kluyskens, Thomas, Biog. Dict.; 1564, Haller]). "Liber de morbo gallico," etc., 1532, 16°. Also in Italian, 1566.

1175. Obverse. Bust. Inscription, engraved: Nicolaus Massa.

Reverse plain. Cast. 50 mm. Struck at Venice.

Rudolphi, 1829, p. 102, No. 431; Kluyskens, ii., p. 191; Duisburg, p. 9, xxi.

Massa might also have been previously alluded to in the present Section, under The Plague.

There are several other medals and tokens, of irregular practitioners and pharmacists, bearing upon syphilitic disease. The first two of them I have already described in my paper upon the medals, etc., of Obstetrics and Gynæcology.

A. The United States.

a. Detroit.

1176. Obverse. Indian head, to left, within thirteen stars. Exergue: 1863.

Reverse. Inscription: Dr. L. C. Rose Treats All—Chronic Female and Venereal—Diseases. Detroit. Copper, bronze, brass.

Weyl, Fonrobert Cat. (Nord-Amerika), Nos. 21,347-9; "War of the Rebellion Tokens," *Coin Collectors' Journal*, vii., 1882, p. 189.

B. England.

a. London.

1177. Obverse. In field, a rhinoceros, to right. Inscrip-

tion : Sir Samuel Hannays' Original Genuine &. | Only | Infallible | Preventive | Of A Certain | Disease

Reverse. Inscription : Sold | Price 10^s 6^d | At No. 7 | Winsley Street | Pantheon. | 2 G^t Ryder Street | S^t James's. & At | N^o 2 Broadway | Back Of | Ludgate Hill Bronze. 17.

Neumann, No. 26,498. In the Lee Collection and my own.

C. Belgium.

It might be thought that the prize medal of the Belgian Royal Academy of Medicine for the "Rob Laffecteur" belonged here, but as the headquarters of that preparation are at Paris, it will be classed in that connection.

D. France.

a. Paris.

Drs. Denys and Boyveau-Laffecteur have already been mentioned, and their noted "Rob." This affords, perhaps, the most remarkable instance of expensive medallic advertising, for several of its tokens are so massive, elegantly executed and pretentious, that they have to be considered as medals equally with the originals themselves. They are known to collectors in this country through the imprint of the Academy of Medicine at Brussels, yet but few are aware of the fact that there exist more than one variety. I shall, however, describe four, and an additional modification, but one of which seems to have been put upon numismatic record. Of these medals and tokens, but two are distinctly French, save that all bear the Paris address of their firm. One of them chronicles a fact that I have previously stated, that Dr. Boyveau-Laffecteur was not the original concocter of the "Rob." The mercantile house was in existence in 1778, while even the treatise of Dr. Denys Laffecteur was not published till 1785.

1178. Obverse. Inscription : Maison Laffecteur | Depuis 1793 | 11 | Rue Des Petits | Augustins | Paris.

Reverse. Inscription : Rob Anti-Syphilitique | Seul Autorisé | En | 1778 | Expéditions | Commerciales. Brass. 16.

Neumann, 39,749. Neumann speaks of it as ten-sided, but in reality it has twelve. It is in my collection.

1179. Obverse. The Arms of the Royal Academy of Medicine at Brussels. A seated female, crowned and with radiated halo. In right hand, a sceptre, palm leaf and wreath; the left rests upon a map lying on a globe. To right, a shield bearing a lion, and a trophy consisting of two cannons with balls, two bayonets, and a flag. To left, winged caduceus and an open book. Inscription: Academie R[le] De Medecine De Belgique. Exergue: Montagny. F.

Reverse. Rob Boyveau-Laffecteur | Seul Autorisé | Par Le | Gouvernment | Et Approuvé | Par L'Acad. Royale | De Médecine | De Belgique | Rue Richer 12 A Paris. Bronze, gilt. 24.

Rüppell has Montagne and Boyeau.

Rüppell, 1875, p. 25. This is in my collection.

1180. Obverse as preceding.

Reverse. Rob B. Laffecteur | Seul Autorisé | Par | Le Gouvern[t] | Et Approuvé | Par L'Academie Royale | De Médecine | De Belgique | —112 Rue Richer | Paris Gilt bronze. 24. 41 mm.

I have found no description of this. It is in my collection.

1181. Obverse as preceding, but inscription in smaller letters, and exergue vacant.

Reverse as preceding. Gilt bronze. 24.

In the Lee Collection and my own. It seems till now un described.

1182. Obverse. Device as in the preceding, save that in place of the shield bearing a lion, there is at left the Gallic cock. Inscription: Medaille D'Encouragement Exergue: Montagny F.

Reverse. Rob Boyveau — Laffecteur | Seul | Autorisé | — | Conseillé | Par | G. De S[t] Gervais | D.M.P. | Rue Riche. No 4 | Paris. Gilt bronze. 24.

This is in my collection. I fail to find it anywhere described,

XVI. Leprosy.

Although leprosy is by so many considered a non-contagious endemic disease, I have thought best to insert it here.

A. The United States.

Dr. B. Rush, of Philadelphia. "Observations, intended to Favor a Supposition that the Black Color of the Negro is Derived from Leprosy." *Trans. Am. Phil. Society*, IV., 1792. Already described in present Section.

B. Scotland.

Dr. Sir James Y. Simpson, of Edinburgh. "Antiquarian Notices of Leprosy and Leper Hospitals in Scotland and England." *Edinburgh Medical and Surgical Journal*, October, 1841; January and April, 1842.

Already mentioned under Typhus. Might also have been referred to under both Small-Pox and Vaccination.

C. France.

Ambroise Paré (1509–90), of Paris. "Traicté de la peste, . . . ; avec une briefve description de la lèpre." Paris, 1568, 12°.

1183. Obverse. Bust, to right. Beneath, Depaulis. F. Inscription: Ambroise — Paré.

Reverse. Né | A Laval | En M.D.IX. | Mort | En M.D.XC. | — | Galerie Métallique | Des Grands Hommes Français. | — | 1819. Bronze. 26.

Rudolphi, 1829, p. 120, No. 499; Kluyskens, ii., p. 293; Duisburg, p. 42, cxviii.

In the Lee Collection, and that of Dr. Stephen C. Martin, of Roxbury, Mass.

The two other medals of Paré, conjoint with Fernel, have been previously described in the present Section, Nos. 1161–62, under Syphilis.

D. Germany.

Dr. Johann H. Kniphof, of Erfurt (1704 [1705, Index Cat. S.-G. O.]–63). The Index Cat. of Surgeon-General's Office adds a second final f to the name. "Lepra Arabum Sive Elephantiasis observata et curata." Erfurt (1727), 4°.

1184. Obverse. Bust, to right. Inscription: D(ominus). Jo. Hieron. Kniphof. Anat. Ch(irurgiae). Et Bot. Pr(ofessor). P(ub-

licus). F(acultatis). M(edicinae). A(ssessor). O(rdinarius). S(acri). R(omani). I(mperii). A(cademiae). N(aturae). C(uriosorum). C(ollega). p(ro). t(empore). Decanus. (rosette.)

Reverse. Within a circular wall, a botanical garden. Legend : Nascitvr Hic Mirae Fertilitatis Honos. Exergue : De Felici Nominali D. 24 Junii, 1748. | Gratulatur. | J. H. W(erner). Bronze, tin. 32 mm.

Rudolphi and Kluyskens omit the P. in Pr. upon the obverse, but the latter corrects this in a foot-note. Duisburg omits the dots between p and t upon the obverse, and after the year of date on reverse. Rudolphi and Kluyskens have Juni. Rudolphi, Kluyskens, and Duisburg omit the dots after Junii and Gratulatur that are given in the figure by Moehsen.

Gaetani, ii., p. 353, pl. 157, No. 2 ; Moehsen, i., p. 241, fig. ; Rudolphi, 1829, p. 87, No. 364 ; Kluyskens, ii., p. 115, No. 1 ; Duisburg, p. 126, cccxxxv., No. 1.

1185. Obverse. Bust, to left. Beneath, W(erner). F. Inscription : D. Joh. Hieron. Kniphof.

Reverse. Hygeia, with staff and cock of Æsculapius, before an altar, on which lie the doctor's hat and academic insignia. Inscription : Facult. Med. Sen(ior). & As(sessor). Pr(imarius). Path(ologiae). & Prax(eos). P(rofessor). P(ublicus). O(rdinarius). S. R. I. A. C. Adj(unctus). & Bibl(iothecarius). Exergue : Rect. Univ. Erfurt. | II. Elect. D. 14 Jul. | 1762. Upon base of altar, Vigilantia. Silver. 35 mm.

Rudolphi and Kluyskens omit the Pr. from reverse, but the former corrects this in a foot-note. They also omit the legend from the altar. Rudolphi, Kluyskens, and Duisburg all substitute Et for the & that Moehsen gives in his figure.

Moehsen, i., p. 249, fig. ; Rudolphi, 1829, p. 87, No. 365 ; Kluyskens, ii., p. 116, No. 2 ; Duisburg, cccxxxv., No. 2, p. 126.

This medal is excessively rare. There is one in the imperial cabinet at Berlin.

Dr. Rudolph Virchow, of Berlin. Sent in 1839 by the King of Sweden to explore the Western provinces of Norway in regard to leprous infection.

Already mentioned in Section IX., Famine ; in the present, Typhoid and Syphilis ; and will be again in XI., Military Hygiene.

The following, which P. and R. have been inclined to class with an epidemic of The Plague, may have been intended to be merely allegorical. It is of the year 1565.

1186. Obverse. A man kneeling before Christ, who has three attendants. Legend : Mvndatvr : Leprosvs : Orans : Secvndvm : Christi : Volv(n)tatem. Silver. 43 mm.

P. and R., Die Deutschen Pestamulete, p. 483, No. 61.

The same authors give also the description of a seal, presumably of the Leper Hospital at Cologne, in the earlier portion of the sixteenth century.

Device. The Saviour, within a chapel, whom a leper approaches from the right. Inscription : Sigillvm· Leprosorvm· Extra· Mvros : Civitatis Coloniês. 50 mm.

XVII. Contagious Ophthalmia.

A. Belgium.

Dr. Florent Cunier, of Brussels (1813 [1812, Duisburg]–1860 [1835, Duisburg]). A memoir on Army Ophthalmia.

1187. Obverse. Two olive branches. Within these an open book, upon which : Annales D'Oculistique Publiées Par Le Dr. Florent Cunier.

Reverse. Oak branches, forming a crown. Bronze. 38 mm.

Guioth, i., p. 303, pl. 58, No. 258 ; Kluyskens, i., p. 235 ; *ibid.*, Num. Med. Belge, p. 30 ; Duisburg, p. 184, ccccxcviii.

Dr. J. F. Kluyskens, of Ghent. "Dissertation sur l'ophthalmie contagieuse qui règne dans quelques bataillons de l'armée de Pays-Bas." Ghent, 1819, 8°. Already described in the present Section, under Vaccination and Typhoid.

Baron Dr. Louis Joseph Seutin, of Brussels (1793–). "Considerations sur l'ophthalmie de l'armée des Pays-Bas." *Ann. de la Soc. des Sc. nat. et méd. de Bruxelles*, 1827, Vol. I.

1188. Obverse. Bust, to left. Beneath, Leopold Wiener F. Inscription : Louis Joseph Seutin — Né A Nivelles Le 18 Oct. 1793.

Reverse. Within laurel boughs tied by ribbon, a patera and drinking serpent. Below : A L'Auteur | De La Méthode | Amovo-Inamovile | La Médecine | Et L'Humanite | 1852. Silver, bronze. 39. 62 mm.

In his first work Kluyskens has a comma after Inamovile, and in his second a dot, though neither of them appear in his figure.

Kluyskens, ii., p. 446, fig. ; *ibid.*, Num. Med. Belge, p. 24, No. 1 ; Duisburg, p. 185, DI. In the Lee and Fisher Collections.

1189. Obverse and reverse similar to preceding, save that F is omitted after Wiener. Bronze. 39. 62 mm.

Kluyskens, Num. Med. Belge, p. 24, No. 2.

1190. Obverse similar.

Reverse. Inscription as in field of No. 1188. In field, within a crown of oak and laurel : Propagée Par Lui A Paris, Londres, Dublin, Edinburgh, Berlin, Vienne, Moscou, St. Petersbourg, Tiflis, Constantinople, Naples, Rome, Turin, Lyon. 39. 62 mm. Duisburg, Suppl. I., 1863, p. 10.

Dr. Jean François Vleminckx, of Brussels (1800–). "Essai sur l'ophthalmie de l'armée des Pays-Bas." Bruxelles, 1825.

1191. Obverse. Bust, to left, with decorations. Beneath, Leopold Wiener. Inscription : J. F. Vleminckx Inspect^{eur} Gen^{al}—Du Service De Santé De L'Armée Belge.

Reverse. Laurel branches tied by ribbon. Above, a serpent encircling a mirror, the handle forming the staff of Æsculapius. In field : A L'Organisateur | Habile, | A L'Administrateur | Intègre. | Au Chef Dévoué | — | Les Officiers Du | Service Sanitaire | 1853. Bronze. 40. 63 mm.

Kluyskens in his first work has Inspecteur upon the obverse.

Kluyskens, ii., p. 588 ; *ibid.*, Num. Med. Belge, p. 28 ; Duisburg, p. 185, dii. ; Rüppell, 1875, p. 59. In the Lee and Fisher Collections, and my own.

B. Germany.

Dr. Carl Ferdinand Von Graefe, of Berlin (1787–1840). "Die epidemisch-contagiöse Augen-blenorrhöe Aegyptens," etc., Berlin, 1823, fol.

1192. Obverse. Head to left. Beneath, G. Loos Dir. C. Pfeuffer. Inscription : Car. Ferd. De Graefe Regi A. Cons. Med. Int. Chir. Milit. Summo Praef. Plur. Ord. Eq. (rosette.)

Reverse. A wreath of oak leaves, transversely bound above and below. Within : Profess. | Meritissimo | Chirurgo | In-

comparabili | Auditores | Obsequiosissimi | D.VIII M. Mart. A. | MDCCCXXIX. Silver, bronze. 30. 44 mm.

Kluyskens has both dates, and Duisburg the latter, in Roman. Rudolphi has Equ.

Rudolphi, 1829, p. 174, No. 286[b]; Kluyskens, i., p. 371; Duisburg, p. 160, ccccxxix.; Rüppell, 1875, p. 45. This is in the Lee and Fisher Collections, and my own.

(*To be continued.*)

THE FOOD OF MAN.—The lower mammals can live and flourish with comparatively little change of diet; not so man. He demands food not only dissimilar in its actual grosser nature, but differently prepared. In a word, for the efferent nervous impulses, on which the digestive processes depend, to be properly supplied, it has become necessary that a variety of afferent impulses (through the eye, ear, nose, palate) reach the nervous centres, attuning them to harmony, so that they shall act yet not interfere with one another.

Cooking greatly alters the chemical composition, the mechanical condition, and, in consequence, the flavor, the digestibility, and the nutritive value of foods. To illustrate: Meat in its raw condition would present mechanical difficulties, the digestive fluids permeating it less completely; an obstacle, however, of far greater magnitude in the case of most vegetable foods. By cooking, certain chemical compounds are replaced by others, while some may be wholly removed. As a rule, boiling is not a good form of preparing meat, because it withdraws not only salts of importance, but proteids and the extractives—nitrogenous and other. Beef-tea is valuable chiefly because of these extractives, though it also contains a little gelatine, albumin, and fats. Salt meat furnishes less nutriment, a large part having been removed by the brine; notwithstanding, all persons at times, and some frequently, find such food highly beneficial, the effect being doubtless not confined to the alimentary tract.

Meat, according to the heat employed, may be so cooked as to retain the greater part of its juices within it, or the reverse. With a high temperature (65° to 70° C.) the outside in roasting may be so quickly hardened as to retain the juices.—*From "Digestion and Related Functions," by Wesley Mills, M.D., in the Popular Science Monthly for October.*

EDITOR'S TABLE.

☞ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, 113A Second Place, Brooklyn, N. Y.

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THE SEVENTEENTH ANNUAL MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION, at Brooklyn, October 22d–25th, 1889, excited more than ordinary local interest, but was attended by a relatively smaller number of members from distant sections than was generally expected, probably because the year has been happily free from the introduction and spread of any epidemic from abroad.

The sessions were held at the Brooklyn Institute, excepting one at the Hoagland Laboratory.

The First Session was called to order at 10 o'clock on Tuesday morning, October 22d, by the President, Dr. HOSMER A. JOHNSON, of Chicago.

Dr. J. H. RAYMOND, Chairman of the Local Committee, welcomed the Association in a brief address, explanatory of the arrangements made for the reception and entertainment of the members and the ladies accompanying them.

"THE OVERSHADOWING OF OUR HOMES," by Dr. W. Thornton Parker, of Newport, R. I., was the first paper read. The chief point urged was the necessity of sunlight as a condition of health. Hence he believed that many trees near dwelling-houses were injurious. Abundant sunlight, pure air, and good soil drainage were essential conditions not easily attainable under overshadowing trees. In the discussion which followed, members from the well-shaded streets of Washington and New Haven took exception to Dr. Parker's rather sweeping conclusions, and claimed that the advantages he urged were not justified by the sickness rates.

"CLOTHING IN ITS RELATION TO HYGIENE," by Dr. James F. Hibberd, of Richmond, Ind. He said: "Much has been done to procure sanitary clothing for soldiers, sailors, and other Government servants, but ordinary citizens have little regard for the varying requirements of the climate. Many dress too warmly to allow proper functions of the skin. The popular estimate of the hygiene of the skin is below its real importance. Interference with the physiological action of the skin endangers health, and is the primary cause of many constitutional disturbances. The clothing should be so arranged as to allow free circulation of air and proper ventilation of the exhalations of the skin, without too great loss of caloric in cold weather. Clothing that irritates the skin produces abnormal perspiration, and predisposes to disease."

Dr. Jerome Walker, of Brooklyn, endorsed the views of the paper, and sustained them by his own experience.

THE HEALTH EXHIBITION was then formally opened with a few remarks by Dr. A. N. Bell, and a recess was taken to visit it. For a description of it and its purposes the reader is referred to the paper on "Object Lessons in Sanitation" on other pages.

The Afternoon Session was opened with a paper on the "CAUSES AND PREVENTION OF INFANT MORTALITY," by Dr. Jerome Walker. He said that the common belief that infant mortality in this country has diminished in recent years is not sustained by statistics. In verification of this statement he cited the excessive death-rate of children in Brooklyn. He laid special stress upon the importance of better provision in public institutions for the care of children, and summarized his conclusions, with regard to such institutions, as follows:

1. That a large proportion of the deaths in them are preventable.

2. That the younger the children and the larger the number, the greater the mortality.

3. That the mortality can be lessened, but the decrease costs money, time, patience, and energy; and to obtain the best results the attending and resident physicians should be reliable, and should be given control over all medical and sanitary matters, and should be held responsible for the same.

He urged the need of more "country weeks," "fresh air

funds," "seaside-homes for children," "summer camps," and the necessity of prolonging the stay of invalid children in open-air resorts, where the evils of over-crowding and of foul air could be counteracted.

"THE RELATION OF THE DWELLINGS OF THE POOR TO INFANT MORTALITY," by Alfred F. White, C.E., of Brooklyn, was the subject of the next paper, in which the author described the recent improvements in the construction of tenement-houses in both English and American cities, with special reference to the buildings of the "Improved Industrial Dwellings Company" in London, and to the "Tower Buildings" in Brooklyn. The special characteristics of these buildings were shown to be: Abundant light and air to every room, and separate sanitary conveniences to each tenant. Stairways are provided only on the outside of the buildings, and there is no common interior shaft or any communication from floor to floor.

In the city of Brooklyn at large, the annual deaths of children under five years average between 9 and 10 to 100, while in the Tower Buildings only 6 or 7 (according to the agent's figures). In Brooklyn the records show no instance in which a contagious disease has been communicated to an adjoining apartment, above or below. Cholera infantum may be lessened in these buildings, in so far as the summer heat is alleviated by thorough ventilation from front to rear in every apartment. In the old-style tenements in New York the Board of Health figures show a corresponding rate of 11.4 per 100.

"A SUGGESTED MINIMUM BASIS OF COMPENSATION TO LOCAL HEALTH OFFICERS," by George Homan, M.D., of St. Louis, next followed, after which the session adjourned.

A PUBLIC RECEPTION was given in the evening at the Academy of Music. Dr. Joseph H. Raymond, Chairman of the Local Committee, presided. He congratulated the Association on its large membership and its work hitherto in arresting the progress of preventable diseases.

HON. ALFRED C. CHAPIN, Mayor of Brooklyn, welcomed the Association to Brooklyn as one of the most healthful cities of the country. The need of such work as this Association performs, he said, is felt in healthy as well as in sickly com-

munities. As the healthfulness of the city is due in part to the vigor and good constitution of its founders, so the promotion of the health of the present generation will bear fruit in its descendants, and succeeding generations will be thankful for our efforts in securing their health. It had been his privilege to give some slight attention to posterity when he first entered upon the office that he filled. He had occasion to sign his name to documents that would fall due about the time for the next generation to pay. He thought that the next generation would be of a serious turn of mind, and it was hoped, therefore, that the deliberations of the present session of the Association would be of a character to help them in grappling with the problems of health. The Association was a body of scientific men, and the work for which they were bound together was both broad and comprehensive, yet it did not cover everything. Each member had probably set apart some one field to which they devoted especial study. It showed that in life some specialty should be thoroughly understood.

Politically the country has arrived at a peculiar condition of things. While the Government was based on a broad foundation, it was constantly becoming more intricate and delicate, and each year was making numerous demands on men who have been especially trained to the work. The problem of politics was becoming more popular yearly, and, notwithstanding its intricate and delicate parts, rests on the bulk of the people not especially trained. In many respects the Association was similar to the Government, inasmuch as individual ones had their respective specialties, while the whole rested on one broad foundation.

"In welcoming you," he concluded, "I will not content myself with congratulating you for the good you are doing throughout the country, but I thank you especially for the particular good you will do in the city in which you are assembled."

Dr. ALEXANDER HUTCHINS gave a welcoming address on behalf of the medical profession. After remarking that an ovation to learned men was by no means rare in the history of science, he said it was an excellent thing for the city of Brooklyn that she, in the person of her chief magistrate, could

throw open her doors to the Association, and so show that, in spite of the toil and heat of a political campaign, she still retained her sympathy with noble workers in a noble cause.

He alluded to the fashion, on the part of some writers, of decrying the medical profession, and said in plain terms that these critics knew but little of the subjects of which they treated. He eulogized the progress of sanitation, and remarked that nothing in the history of the past could parallel the magnificent sanitary methods of the present.

Dr. H. A. JOHNSON, of Chicago, President of the Association, then delivered his address, an abstract of which is given on other pages.

THE REV. RICHARD S. STORRS was then introduced, and was very warmly received. He said it was natural that the physician and minister should be together. So much of value had been said that there was only one subject left for him. He always felt that one great element in medical equipment was character. The atmosphere of a sick house was changed and invigorated when a happy and good-natured physician entered. Character was a great power, which every physician should appreciate. As regards discoveries, it was well known that the most important ones of the past fifty years were made in America.

"Brooklyn is a young city, and has a young Mayor, and I welcome you to it and its libraries. As President of the Long Island Historical Society, and on behalf of its directors, I welcome you to it."

EX-MAYOR SETH LOW was the next speaker. He said that it afforded him great pleasure to be present and join in welcoming the members of the American Public Health Association to Brooklyn. The members should enlist the interest of politicians in prolonging the life of their constituents, but then the question would arise as to whether they were not also prolonging the lives of their opponents. He had heard that the sanitary exhibition now being held under the auspices of the Association displayed some excellent samples of the plumbers' work. He feared though that they were simply that portion of work as really seen by the public. What he would like to see exhibited was that which was concealed and brought disease and sorrow to many families.

The second day, October 23d, "THE UNITED STATES CENSUS IN ITS RELATION TO SANITATION," by John S. Billings, Major and Surgeon, U. S. Army, was the first paper.

He dwelt especially upon the importance of the collection of vital statistics. He said: "One of the most important questions to be settled before the census is taken is, What shall be the boundaries of the special districts of the city for which a separate statement of the population is desired? In some cities the wards form fairly satisfactory districts for the purpose, and where this is the case it makes the problem very easy. If the officer charged with the registration of vital statistics makes timely application to the Superintendent of the Census, he can obtain from him in due time a statement of the population by wards, with distinction of sex and of color and of age, or, at all events, of the number under one year and under five years of age, which is the information most essential in a sanitary point of view. Wherever there is a fairly accurate registration of deaths, which now exists in several States and in over one hundred cities, the next census will afford the means of calculating death-rates with distinctions of color, sex, and age, which will furnish important indications for sanitary work. For all cities of 10,000 inhabitants and upward it is proposed to collect as complete information as possible with regard to altitude, climate, water-supply, density of population, sewerage, proportion of sewered and non-sewered areas, and other points bearing on the healthfulness of the place which will permit of interesting comparisons with the death-rates. I have no authority to make specific promises, but I believe that the reports of the next census, in which the members of this Association are specially interested, will be published as soon as it is possible to complete them, and will be distributed to those sanitarians and physicians who need them in their work and who make timely request for them; and thus believing, I do not hesitate to ask the cordial co-operation of all members of this Association to make the data upon which these reports are founded as full and accurate as possible."

"THE PREVENTION OF PHTHISIS PULMONALIS AND METHODS FOR ITS LIMITATIONS," by Ezra M. Hunt, M.D., Secretary of the State Board of Health of New Jersey, was the subject of the next paper. It criticised the commonly accepted view

that the danger of infection is chiefly confined to the inhalation of the dried sputa of persons affected with the disease, and advocated the theory that the disease may be communicated by the breath of such persons.

"IMPROVEMENTS AT THE NEW YORK QUARANTINE STATION" were shown by Dr. William M. Smith, Health Officer of the Port. Illustrations of the ground plans were shown by using the stereopticon. The disinfecting chamber in process of construction was described in considerable detail, on the conclusion of which, at twelve o'clock, the session adjourned, and proceeded, on the invitation of Dr. Smith, to take an excursion to and make personal inspection of the quarantine establishment. Much gratification was expressed by the visitors at the forward state of the repairs and additions in progress, which, when finished—if in the manner contemplated—will unquestionably constitute the most complete establishment in the world for all that a quarantine should be—an institution for the effectual protection of the public health, with the least possible obstruction to commerce; one that is equipped with the best possible facilities for promptly dealing with and preventing the introduction of infectious diseases, by the segregation and proper treatment of the sick, effectual means for the purification of infected vessels and dealing with infected material of every kind, with the least possible delay consistent with public safety.

The Evening Session of this day was a great disappointment to many ladies on account of a blunder in the programme. The ladies had been induced to attend early to hear the paper on and witness the "Art of Cooking," by Edward Atkinson, LL.D., of Boston, but on assembling they found the programme reversed.

"RECENT RESEARCHES RELATING TO THE ETIOLOGY OF YELLOW-FEVER" (illustrated with the stereopticon), by George M. Sternberg, M.D., Major and Surgeon U. S. Army, Baltimore, Md.

"PRELIMINARY OBSERVATIONS ON THE MICRO-ORGANISM OF TEXAS FEVER," by Dr. Theobald Smith, of Washington, D. C.

"SOME GENERAL OBSERVATIONS ON TEXAS FEVER" (illustrated with the stereopticon), by D. E. Salmon, D.V.M. Chief of the Bureau of Animal Industry, Washington, D. C.

These were all interesting to biologists and those engaged in the prevention of the diseases discussed, but before their conclusion more than half the audience, who were attracted by the paper on cooking, had left.

Dr. Sternberg's paper added but little to what he has before published on the same subject. Neither he nor any one else appears to have as yet discovered the veritable yellow-fever germ. The microbes of Freire, Finlay, and Gibier have not been found sufficiently often in the blood or the tissues of yellow-fever patients or cadavers to verify the relations claimed for them.

The papers of Drs. Smith and Salmon were also deficient of anything new on the subject of which they treated.

Dr. Salmon described some resemblance in the discoloration of the liver of yellow-fever in man and Texas fever in cattle, but he regards it as a coincidence only, without any significance with regard to the nature of the respective diseases.

"THE ART OF COOKING," by Mr. Atkinson, was admirably demonstrated, though not to the audience, as at first provided. The true science of cooking, he said and measurably demonstrated, consists in the regulated and controlled application of heat, by which flavors are developed, and the work of conversion is accomplished. For this purpose a quantity of fuel is required which is almost absurdly small compared to the quantity commonly used. He proceeded to show that most of our methods of cooking in families are wasteful, and that the operation may be performed in a satisfactory manner by the heat of a kerosene lamp of proper construction. He stated the principles of the science of cooking as follows:

1. The heat should be derived from fuel which can be wholly consumed or wholly converted into the products of complete combustion without any chimney except that of the lamp or burner. The fault with coal, especially anthracite, is that it is not evenly or wholly consumed; hence the need of a chimney to take away the gases developed and not wholly consumed; but the chimney also carries off the greater part of the heat. It is very evident that the crude combustion of coal and the direct application of the heat generated will erelong give way to more scientific methods of consuming the gaseous products, and of deriving the heat from the final combustion of the

gaseous products in all arts. In the matter of cooking, kerosene oil burned in any one of the types of lamp which have a central duct to convey oxygen from below to the inner side of a circular wick, when properly trimmed and served with well-distilled oil, gives substantially perfect combustion. The same may be said of illuminating gas when used in one of the burners of the Bunsen type, which supply an excess of oxygen and yield the blue flame. The combustion of oil and of gas can be brought under absolute control by gauging the size of wick or burner to the work to be done.

2. The oven in which the food is to be subjected to this measurable and controllable source of heat must be so constructed that the heat imparted to it may be entrapped and accumulated up to a certain measure or degree and then maintained at that temperature without substantial variation until the work is done. This can be done by jacketing the oven in a suitable way with material which is incombustible and also a non-conductor of heat.

3. There should be no direct communication between the true oven or receptacle in which the food is placed and the source of heat, lest the products of incomplete combustion should sometimes taint the food, and lest the food should be exposed to being in places burned or scorched.

At the close of his paper and of the evening session, the audience were supplied with a lunch which had been prepared in the cooking-apparatus while he was reading his paper.

The third day, October 24th, "THE DISPOSAL OF GARBAGE AT MILWAUKEE," by Dr. R. Martin, Health Commissioner of that city, was the subject of the first paper.

"STATISTICS ON RIVER POLLUTION, WITH OBSERVATIONS RELATING TO THE DESTRUCTION OF GARBAGE AND REFUSE MATTER," by Dr. S. S. Kilvington, Health Commissioner of Minneapolis, Minn., followed. In the Mississippi River during the past year, Dr. Kilvington said, eight cities alone deposited 152,675 tons of garbage and offal, 108,250 tons of night-soil, and 3765 dead animals.

In the Ohio River, five cities in the same period dumped 46,700 tons of garbage, 21,157 tons of night-soil, and 5100 dead animals. In the Missouri River, four cities cast 36,100 tons of garbage, 22,400 tons of night-soil, and 31,600 dead animals.

No theory of self-purification of running water will serve to dwarf the magnitude of this sanitary crime. Cremation is the better way of destroying combustible materials, and sewage and night-soil should be deodorized, diluted, and used as a fertilizing agent. This method has been proved a practical success in many large cities. There were twenty-three out of thirty-five health officials written to, who indorsed the cremation system. Household cremation of animal and vegetable waste, by kitchen ranges and furnaces, is an economic and sanitary possiblity.

This subject elicited an animated discussion. It was followed by

"FOOD IN ITS RELATION TO HEALTH," by Professor W. O. Atwater, Director of Office of Experiment Stations, Department of Agriculture, Washington. Charts were exhibited, upon which were graphically shown the nutritive value of different dietaries, and comparing the quantities of food consumed by various classes of people in the United States and Europe. Great injury results in this country from overeating, particularly of meats and sweetmeats. The standard of German physiologists is exceeded by nearly all classes here. Sedentary persons consume as much food as would be required for active muscular work. The system is taxed in excretion of the excess of food, and thus undermined and predisposed to disease. The lowest dietary was shown to be that of English seamstresses, and the highest that of bricklayers at Cambridge, Mass. Those of American laborers were generally higher than those of the same classes in other countries.

The Afternoon Session was held at the Hoagland Laboratory.

"THE PREVENTION AND RESTRICTION OF TUBERCULOSIS IN MAN" was the subject of two papers—one by Dr. E. Playter, of Ottawa, Can., and the other by Dr. P. H. Kretzschmar, of Brooklyn. Dr. Playter's was chiefly confined to predisposing causes—malformation of the chest and insufficient exercise of the lungs; Dr. Kretzschmar's to the importance of segregation of consumptives and protection against the dissemination of the sputa. Carpets should be banished from the homes of consumptives, and pocket-flasks provided with disinfectants should be carried instead of handkerchiefs under conditions when spittoons cannot be provided.

"DISINFECTION OF DWELLINGS BY SULPHUR DIOXIDE," by Dr. Cyrus Edson, Chief Inspector of the New York City Health Department, was an account of extended experience in the use of this agent, which led to the conclusion on his part that it is a thorough and almost perfect destroyer of the infection of the acute exanthemata and diphtheria, as shown by the non-recurrence of such diseases where the premises had been subjected to this agent. The paper was followed by a lengthy discussion, in which very diverse opinions were expressed as to the value of this disinfectant. Some of the members expressed entire confidence in its efficiency as advised by the Committee on Disinfectants of the Association, the necessity of the presence of moisture having been more definitely shown by recent experiments; while others doubted its efficiency.

"SANITARY ENTOMBMENT," by the Rev. Charles R. Treat, was the first paper at the evening session, illustrated by numerous stereopticon views. After reviewing the practice of earth-burial in churchyards and cemeteries, and showing the injury to the health of residents adjoining such places, he spoke of the effect of the atmosphere upon corpses exposed in cold or dry climates, and compared the result obtained by embalming. A method of entombment on a large scale within a small area, by a sort of co-operative building plan, was then suggested. The bodies, enclosed in the apartments thus provided, would be subject to a constant current of desiccating air, to secure the same effect as that of the atmosphere in Arizona, Palermo, or Western Peru.

"DO THE SANITARY INTERESTS OF THE UNITED STATES DEMAND THE ANNEXATION OF CUBA?" was the somewhat remarkable conundrum submitted and advocated affirmatively by Benjamin Lee, M.D., of Philadelphia Secretary of the State Board of Health of Pennsylvania. The reason given was the constant communication between this country and Havana, and the frequent prevalence there of yellow-fever, small-pox, and leprosy, on account of which he thought the United States should have control of the population. The only means of eradicating yellow-fever, particularly, was, he said, a proper system of sewerage and drainage, which the Spanish Government is not likely ever to undertake.

"THE UTILIZATION AND PURIFICATION OF SEWAGE," by

Dr. John H. Rauch, Secretary of the State Board of Health of Illinois, was read by title only, as the author was absent, and the session adjourned.

Friday, October 25th, the fourth and last day, Dr. D. E. Salmon, D.V.M., Chief of the Bureau of Animal Industry, Washington, read a paper on

"THE NECESSITY FOR A MORE RIGOROUS INSPECTION OF MEAT-PRODUCING ANIMALS AT THE TIME OF SLAUGHTER."

Dr. A. L. Gihon, U. S. Navy, read a paper prepared by Dr. R. O. Beard, of Minneapolis, on "THE CAUSES OF INFANT MORTALITY." The prevention of infantile disorders, he said, would be greatly promoted by the education of the people in sanitary matters. One of the great mistakes of the present day was to regard infants' stomachs as of a different character from those of adults. The too frequent feeding of infants is a vice almost universally prevalent, and quite generally countenanced or actually encouraged by the profession.

"RAILWAY SANITATION," by W. S. Latta, of Trenton, N. J.; "AMERICAN METHODS OF MANUFACTURING OLEOMARGARINE," and the "OLEOMARGARINE LAW IN THE UNITED STATES," by Edgar Richards, were read by title only, and referred to the Publication Committee.

OFFICERS ELECT AND THE NEXT PLACE OF MEETING.

On report of the Advisory Council the Association decided to hold the next meeting at Charleston, S. C., not earlier than November 1st, 1890.

The following officers were elected for the ensuing year: President, Dr. H. B. Baker, of Lansing, Mich.; First Vice-President, Dr. Frederic Montizambert, of Quebec; Second Vice-President, Dr. Joseph H. Raymond, of Brooklyn; Secretary, Dr. Irving A. Watson, of Concord, N. H.; Treasurer, Dr. J. B. Lindsley, of Nashville, Tenn; Executive Committee, Drs. L. F. Salomon, of New Orleans, La.; William Bailey, of Louisville, Ky.; H. B. Horlbeck, of Charleston, S. C.; Walter Wyman, of Washington, D. C.; J. F. Kennedy, of Des Moines, Ia.; P. H. Bryce, of Toronto, and the twelve ex-Presidents of the Association.

A new Advisory Council, composed of a member from each State and province, was announced, a resolution of thanks to

the city officials, the New York Quarantine officers, the Local Committee, and others, was adopted, and the Association adjourned.

OUR EXCUSE for the brevity of the foregoing abstract of the proceedings is our purpose to follow it in succeeding numbers with several of the papers in full; and, moreover, with the public addresses in connection with the Health Exhibition, still open and attracting increasing interest at the time of this writing.

THE BRITISH DEGREE IN STATE MEDICINE.—According to the educational number of the *British Medical Journal*, nearly all the examining bodies of Great Britain and Ireland grant special degrees in public health or State medicine. The Royal College of Physicians and the Royal College of Surgeons hold examinations, consisting of two parts, in July and December. Candidates must be at least twenty-three years of age before admission to part first, and at least twenty-four years of age before admission to part second, of the examination; and they must be registered as qualified practitioners. Both examinations may be taken in the same month. Part I. consists of: (1) Physics in its application to health, with reference to (*a*) warming and ventilation; (*b*) water-supply, sewerage, and drainage; (*c*) sanitary construction. (2) Meteorology in relation to health. (3) Chemistry in relation to the examination of air and water. (4) Microscopical examinations as applied to air, food, and water. (5) Geology in relation to drainage and water-supply. (6) Statistics in relation to health. Part II.: (1) The origin, growth, and prevention of disease: (*a*) the special pathology of endemic and epidemic diseases; (*b*) the influence of climate, season, and soil; (*c*) the effects of unwholesome air, water, and diet; (*d*) diseases of animals in relation to the health of man; (*e*) the influence of occupation and lodging; (*f*) isolation, quarantine, disinfection, and vaccination. (2) Sanitary work and administration: (*a*) the health requirements of houses, villages, and towns; (*b*) the sanitary regulations of households, establishments, and occupations; (*c*) the prevention and control of epidemic and endemic diseases. (3) Statutes and by-laws relating to public health. (4) The duties of sanitary authorities.

THE PROGRESS OF INFECTIOUS DISEASES AND MORTALITY RATES AT THE MOST RECENT DATES, BASED UPON OFFICIAL AND OTHER AUTHENTIC REPORTS.

ALABAMA.—*Mobile*, 40,000: Reports 79 deaths during September, of which 23 were under five years of age. Annual death-rate, 23.7 per 1000. From zymotic diseases, 24, and from consumption, 9.

CALIFORNIA.—For the month of September, 1889, the Secretary's abstract of the reports received from 106 cities and towns, with an aggregate population of 799,500, the number of deaths was 876. Annual death-rate, 13.08. Deaths from consumption during the month, 121. From zymotic diseases: Diphtheria and croup, 31; typhoid-fever, 27; typho-malarial-fever, 5; cerebro-spinal-fever, 8; diarrhœal diseases, 45; whooping-cough, 1; scarlatina, 3.

San Francisco, 330,000: During the month of September the number of deaths was 453. From zymotic diseases, 56; consumption, 56.

Los Angeles, 80,000: 59; from zymotic diseases, 19; consumption, 4.

Oakland, 60,000: 72; from zymotic diseases, 8; consumption, 7.

San Diego, 32,000: 20; from zymotic diseases, 1; consumption, 1.

Sacramento, 35,000: 30; from zymotic diseases, 3; consumption, 6.

CONNECTICUT.—The State Board of Health reports for September in 167 cities and towns, with an aggregate population of 757,822, a total of 1040 deaths, of which 308 were under five years of age, and representing an annual death-rate of 16.4 per 1000. There were 272 deaths from zymotic diseases, and 116 from consumption.

Our *New Haven* correspondent writes: "Probably this is the only city in the civilized world where it is openly advocated, in the public press, that filth is not a cause of disease; that, on the other hand, it is wholesome, and that the germ theory

of zymotic disease is utterly a delusion, and public sanitation a folly, if not worse. Yet some of our newspapers have published this by columns within this year."

DISTRICT OF COLUMBIA.—Total deaths during four weeks ending September 28th, 381, of which 140 were under five years of age. There were 185 deaths in the colored population. Annual death-rate, 20.35. Zymotic diseases caused 118 deaths, and consumption, 47.

FLORIDA.—*Pensacola*, 15,000: Reports for four weeks ending September 28th, 34 deaths, of which 10 were under five years of age. Annual death-rate, 29.44 per 1000. There were 19 deaths from zymotic diseases, and 3 from consumption.

ILLINOIS.—*Chicago*, 1,100,000. For the month of September the Commissioner of Health reports: Total number of deaths, 1601, of which 840 were under five years of age. Annual death-rate, 16.46 per 1000. From zymotic diseases there were 542 deaths, and from consumption, 121.

IOWA.—The *Bulletin* of the State Board of Health reports for the month of September as follows:

Diphtheria: Morning Sun, Louisa County; Humboldt, Humboldt County; Hampton, Franklin County; Arbor Hill, Adair County; Fairfield, Jefferson County; Pella, Marion County; Hastings, Mills County; Panora, Guthrie County; Franklin Township, Lee County; Iowa Township, Cedar County; Letts, Louisa County; Sutherland, O'Brien County.

Scarlet-fever: Lacey, Mahaska County; Greenfield, Adair County; Summerset, Warren County; Humboldt, Humboldt County; Perry, Dallas County; Atlantic, Cass County; Indianola, Warren County; Randolph, Fremont County.

Measles: Bloomington Township, Decatur County.

Typhoid-fever: Wesley, Kossuth County; Randolph, Fremont County.

Small-pox: A mild case of varioloid was reported near Portsmouth, in Shelby County; also near Eldridge, Scott County.

LOUISIANA.—*New Orleans*, 254,000 : During the four weeks ending September 28th there were 452 deaths, of which 129 were under five years of age. Annual death-rate per 1000, whites, 20.63 ; colored, 30.27 ; total population, 23.21. From zymotic diseases there were 32 deaths, and from consumption, 28.

MARYLAND.—*Baltimore*, 500,343 : During the four weeks ending September 28th, there were 638 deaths, of which 259 were under five years of age. Annual death-rate, 16.58 per 1000. There were 133 deaths from zymotic diseases, and 92 from consumption.

MICHIGAN.—For the month of September, 1889, compared with the preceding month, the reports indicate that typho-malarial-fever, whooping-cough, typhoid-fever (enteric), and diphtheria increased, and that cholera morbus, erysipelas, and inflammation of bowels decreased in prevalence.

Compared with the average for the month of September in the three years, 1886–88, cholera infantum, inflammation of kidneys, whooping-cough, and cerebro-spinal meningitis were more prevalent, and influenza, diphtheria, puerperal-fever, and scarlet-fever were less prevalent in September, 1889.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of September, 1889, at thirty-four places, scarlet-fever at twenty places, typhoid-fever at forty-seven places, and measles at seven places.

Reports from all sources show diphtheria reported at thirteen places more, scarlet-fever at two places more, typhoid-fever at seven places more in the month of September, 1889, than in the preceding month.

Detroit, 250,000 : Reports for September 303 deaths, of which 79 were under five years of age. Annual death-rate, 14.74 per 1000. From zymotic diseases there were 109 deaths, and from consumption, 22.

MINNESOTA.—Distribution and mortality from specified diseases in Minnesota for the month of September, 1889, as reported up to October 20th : (Population estimated 1889, cities

over 2000 inhabitants, 539,000 ; towns and villages, 1,047,860). Total number of deaths, 913—83 less than last month ; 499 males, 414 females ; 56.3 per cent occurred in cities over 2000 population. Ages, under 1 year 40.85 per cent ; 1 to 5 years, 15.33 per cent ; 5 to 15 years, 6.02 per cent ; 15 to 30 years, 12.6 per cent ; 30 to 50 years, 9.96 per cent ; 50 to 70 years, 8.21 per cent ; over 70 years, 6.57 per cent. Of 373 deaths under 1 year, 55.76 per cent were in cities ; from 1 to 5 years, 53.56 per cent were in cities.

St. Paul, 180,000 : Reports for September 165 deaths, of which 92 were under five years of age. Annual death-rate, 11.00 per 1000. From zymotic diseases, 55, and from consumption, 5.

MISSOURI.—*St. Louis*, 450,000 : Reports for September 651 deaths, of which number 257 were under five years of age. Annual rate of mortality, 17.36 per 1000. From zymotic diseases there were 165 deaths, and from consumption, 44.

NEW HAMPSHIRE.—The following contagious and infectious diseases were reported to the State Board of Health for the month of September :

Diphtheria : Keene, 25 cases. The local Board of Health says : " These cases have been investigated by the Board, and in many cases the sanitary surroundings have been improved by ordering connections with the public sewer, use of disinfectants, isolation of the sick, etc." Manchester, 10 ; Portsmouth (for August and September) 8 ; Andover, 5 ; Newport, 5 ; Goffstown, 2 ; Claremont, Conway, Rye, and Amherst, 1 each.

Scarlet-fever : Manchester, 12 ; Concord, 5 ; Nashua, 1 ; Rochester, 1 ; Tilton, several cases which were not reported by the town authorities.

Typhoid-fever : Manchester, 14 ; Laconia, 5 ; Rindge, 4 ; Newport, 4 ; Nashua, 4 ; Hudson, 4 ; Bradford, 3 ; Keene, 3 ; Portsmouth, 2 ; Hooksett, 2 ; Loudon, 2 ; Barrington, 2 ; Concord, Wolfeborough, Greenland, Rochester, and Sandwich, 1 each.

NEW JERSEY.—*Hudson County*, 282,254 : During the month

of September there were 521 deaths, of which number 255 were under five years of age. Annual death-rate, 22.2 per 1000. The deaths from zymotic diseases numbered 142, and from consumption, 49.

Paterson, 85,000 : Reports 117 deaths during September, of which number 58 were under five years of age. Annual death-rate, 16.5 per 1000. There were 30 deaths from zymotic diseases, and 23 from consumption.

NEW YORK.—The *Bulletin* of the State Board of Health for September states that there were 8265 deaths reported during the month in 128 cities and towns aggregating 4,023,863 population.

The average mortality for September for the last five years is 7690 ; or 575 less than that of September, 1889. The proportion of infant mortality is a little below the average, which is about 41 per cent. From all zymotic diseases the proportion of deaths in each 1000 deaths from all causes was 266.75 during September of the last five years ; that of this month is 234.26. About half of the zymotic mortality is from diarrhœal diseases, which is less than the average for September of recent years ; a good number of the deaths in this class are returned as dysentery. About 2.8 per cent of all deaths occurred from typhoid-fever in September of the four preceding years ; this month 3 per cent of the mortality is from this cause ; in August, 2.40. There is no material change in the prevalence of other zymotic diseases. There were 114.83 per 1000 deaths from consumption ; 186.10 per 1000 above five years of age.

New York, 1,571,558 : Total deaths, 2913—1221 under five years. Annual death-rate, 22.50. From zymotic diseases there were 630 deaths, and from consumption, 422.

Brooklyn, 821,525 : Total deaths, 1391—646 under five years. Annual death-rate, 20.61. From zymotic diseases there were 306 deaths, and from consumption, 157.

Buffalo, 230,000 : Total deaths (four weeks ending September 28th), 390—204 under five years. Annual death-rate, 21.18. From zymotic diseases there were 123 deaths, and from consumption, 30.

Rochester, 130,000 : Total deaths, 172—84 under five years.

Annual death-rate, 15.87. From zymotic diseases there were 46 deaths, and from consumption, 15.

Albany, 103,000: Total deaths, 178—55 under five years. Annual death-rate, 20.74. From zymotic diseases there were 52 deaths, and from consumption, 19.

Syracuse, 80,000: Total deaths, 114—39 under five years. Annual death-rate, 17.81. From zymotic diseases there were 42 deaths, and from consumption, 13.

The highest rates of mortality were as follows: Brookfield, 49.45; Geneva, 38.00; Tonawanda, 36.00; Gravesend, 36.00; Cazenovia, 35.45.

The lowest rates of mortality were as follows: Oneida, 2.40; Coxsackie, 3.00; Seneca Falls, 4.00; Fort Ann, 5.60; Saugerties, 6.

NORTH CAROLINA.—Aggregate population of the towns reporting for the month of September was 121,700, of which 55,315 were colored. Total deaths, 186, of which 113 were colored. Deaths under five years, 68, of which 40 were colored. Annual death-rate, 13.2 in the white population, 24.5 colored, and 18.3 in the total population per 1000. From zymotic diseases there were 45 deaths, and from consumption, 23.

Wilmington, 23,000: Total deaths, 53. Annual death-rate per 1000, 27.4.

Charlotte, 13,000: Total deaths, 24. Annual death-rate per 1000, 22.2.

Asheville, 10,000: Total deaths, 9. Annual death-rate per 1000, 10.8.

PENNSYLVANIA.—*Philadelphia*, 1,040,245: Reports for four weeks ending September 28th, 1384 deaths, of which 537 were under five years of age. Annual death-rate, 17.34 per 1000. From the principal zymotic diseases there were 175 deaths, and from consumption, 180.

Pittsburg, 230,000: Reports 249 deaths during the three weeks ending September 21st, of which number 108 were under five years of age. Annual death-rate, 15.4. From zymotic diseases (exclusive of diarrhœal) there were 51 deaths, and from consumption, 14.

RHODE ISLAND.—The number of deaths recorded in twenty-three towns and cities during September, from which returns have been received, was 499, in an estimated population of 312,310. The annual death-rate upon the estimate given is 18.1 per 1000.

Providence, 127,000: Reports for September 209 deaths, of which number 74 were under five years of age. Annual death-rate, 19.75. From zymotic diseases there were 55 deaths, and from consumption, 28.

TENNESSEE.—The principal diseases, named in the order of their greater prevalence, in the State during September were: Malarial-fever, dysentery, diarrhœa, consumption, rheumatism, pneumonia, tonsillitis, cholera infantum, and bronchitis.

Typhoid-fever is reported in the counties Bledsoe, Carroll, Chester, Davidson, Franklin, Gibson, Grundy, Hamilton, Hardeman, Hawkins, Houston, Knox, Montgomery, Roane, Robertson, Smith, Stewart, Sumner, and Washington. Diphtheria in Crockett, Davidson, Hamilton, Hancock, Hardin, Hawkins, Knox, Maury, Montgomery, Roane, Robertson, and Shelby. Scarlet-fever in Blount, Hardin, Knox, Madison, Robertson, Shelby, and Sullivan. Whooping-cough in Bledsoe, Blount, Davidson, Houston, Knox, Lawrence, and Sumner. Mumps in Lawrence and Wayne. Erysipelas in Hardeman and Houston. Measles in Davidson. Roseola in Bledsoe. Varicella in Houston. Small-pox in Henderson.

Chattanooga,	white,	11.10;	colored,	17.53:	13.20
Clarksville,	"	12.00;	"	12.00:	12.00
Columbia,	"	4.00;	"	18.00:	11.00
Knoxville,	"	10.68;	"	30.07:	20.37
Nashville,	"	12.61;	"	28.81:	20.76

WISCONSIN.—*Milwaukee*, 210,000: Reports 303 deaths in September, of which 98 were under five years of age. Annual death-rate, 17.3 per 1000. From zymotic diseases there were 96 deaths, and from consumption, 25.

THE PROGRESS OF CHOLERA IN PERSIA.—Abstract of Dr. Gabuzzi's letters to the *Journal d'Hygiene*, September 26th to October 16th. Cholera having crossed the Turco-Persian

boundary, has spread to all the parts of Persia lying between Haneguine and Kermanshah, and also to Hanezi, opposite Asmara. According to telegrams from the Sanitary Inspectors of Bagdad and Mosul, the epidemic is decreasing in these provinces.

The cities in which cholera has been most severe from the 15th to the 22d of September, are Kerbella, in which there were 111 deaths and 183 in Kerbrouk.

The places lately attacked are : Hezerta on the Bastarochai, a tributary of the Greater Zarb, to the east of Massoul and Zanh, near Kerbrouk, and also Sélimanie.

"The quarantine stationed at Hilt has been moved back to Déir. It is there that Persian pilgrims of Nedjeff and Kerbella are subjected to a rigid quarantine before going to Bassorah on their way to Persia.

"According to information received at the Sanitary Bureau, a progressive diminution in the mortality from cholera has been observed in all the infected districts in Mesopotamia. During the week, from September 10th to 16th, the deaths were 1559 ; from September 17th to 25th, 1083 ; and from the 26th to the 30th only 268.

"The new places invaded are ranged along the Turco-Persian frontier (Badra, Zorbatia, Zaber, etc.).

"Cholera has also occurred in Altin, Keupru, and in many of the villages in the neighborhood of Suleymania.

"Sanitary cordons are reported from day to day as having been established beyond the centres of infection. The last was formed between Déir and Zebarcoub, in order to place the caravans which go from Bagdad to Aleppo within the quarantine.

"The letter of October 8th confirms the report of the diminution of the epidemic in Mesopotamia. At Bassorah, from September 26th to October 6th, there were only three deaths from cholera ; there were no deaths in Bagdad from October 1st to 5th. The new places infected were Keysangiah and Karabey near Altinkeupru on the Little Zarb.

"The sanitary cordon which was placed there has been removed farther to the north, to Kelch and to Revandouz, with posts of observation at Rayet and at Kalakin on the Turco-Persian frontier. To the west of this district, on the right

bank of the Euphrates, there are two sanitary stations, one at Cairetine, the other at Meskéné, to protect Aleppo.

"At Damascus, the station for dromedaries coming from Hilt, has been disinfected.

"The reports from Persia contain the intelligence of an increase in the mortality from cholera in the infected districts along the Turco-Persian frontier."

The letter dated Constantinople, October 16th, states that "the accounts of the decrease of cholera in Mesopotamia have been confirmed; the weekly bulletin gives 148 deaths, while no new places have been invaded beyond the previous limit of the epidemic.

"The news received from Persia is, on the other hand-alarming; a great panic occurred at Kermanshah, where the terrified inhabitants abandoned the city entirely. Since September 30th 290 deaths have been recorded.

"To complete the calamity a very fatal epizootic broke out among the cattle at Terpoul, and a cordon to prevent further ingress has been established at Bana, Sacchis, and Murivan.

"It seems now clear that the cholera in Persia was brought from Bassorah to Bouchir."—*Translated by T. P. C.*

WHAT'S IN A WORD?—A New York pastor, who, though a Scotchman, had lived in America over forty years, was one day taken to task by his daughter for the broadness of his accent in the pronunciation of the word difference.

"How do I pronounce it?" he asked.

"You say 'dufference.'"

"And what do *you* say?"

"Difference."

Looking at her for a moment, and getting her to repeat, he continued, "Well, now, M——, will you just be so kind as to tell me the dufference between *dufference* and *dufference?*"

The daughter gave up her hopeless scholar to "gang his ain gait" in pronunciation henceforth.—*Editor's Drawer of Harper's Magazine for September.*

LITERARY NOTICES.

IMPURE DRUGS AND POISONS. Report of WILLIS G. TUCKER, M.D., Ph.D., Analyst of Drugs, extract from the Ninth Annual Report of the State Board of Health of New York, shows the percentage of 505 samples of pharmacopœal drugs, examined as follows: Good quality, 43.8; fair quality, 17.4; inferior quality, 26.0; not as called for, 11.6; excessive strength, 1.2.

"These percentages do not differ very materially from those of last year. As stated in my last annual report, they 'by no means represent the proportions of good, bad, and indifferent drugs on the market and on sale at the stores, since only those articles which were considered likely to be adulterated or known to be frequently of inferior quality, were collected. Had samples of drugs and pharmaceutical preparations been selected at random, the proportion of pure and good articles would have been very much larger.'"

Appended he reports on "the nature of the substances commonly sold for the destruction of vermin of all kinds," the active properties of the most of which are due to arsenic or corrosive sublimate, and of the rest to almost equally poisonous substances. Yet these substances are subject to sale without restriction!

"There can be no doubt that the general sale and use of such substances is exceedingly hazardous. If they must be used at all, the traffic in them should be regulated and controlled by law."

MANUAL OF AMERICAN WATER-WORKS. Edited by M. N. BAKER. Published by *Engineering News*, New York. This book is full of information of practical advantage to the engineering profession and to water-works companies, so arranged as to be a ready reference to subject-matter pertaining to the history, construction, and maintenance of every water-works plant in the United States and Canada; and is the first of a series, one to be published annually hereafter, with the purpose of showing progress of such works and such improve-

ments in their structure as may be gleaned from practical experience. Additional matter will be added to the subsequent manuals to enlarge upon the present volume, and the significant importance of water-works to every community in relation to health is worthy of investigation at once. The first volume of the "Manual of American Water-works" is a necessity, in order to obtain the information up to date.

EVERY-DAY BIOGRAPHY: A Collection of Brief Biographies arranged for every day in the year. Designed as a Book of Reference for the Teacher, Student, Chautauquan, and Home Circle. By AMELIA J. CALVER. 12mo, pp. 378; cloth, price, $1.50. New York: Fowler & Wells Co., Publishers.

The 378 pages of this book are made to comprise the 365 days of the year, giving the birthdays and sketches of the lives of eminent persons of all ages. Would you know, for instance, what persons of eminence were born on May 20th, turn to the page on which that date occurs, and you will find Henry Percy ("Hotspur"), Dorothea P. Madison, David Dudley Feld, John Stuart Mills, Antoinette Brown Blackwell, Rose Hawthorne Lathrope, each of these having a short sketch, indicating the nature of his or her distinction.

A very full index is given, in the arrangement of which the author has shown unusual cleverness; she has provided an alphabetical division and also an analytical. In the latter the characters are distributed under headings indicative of their several pursuits or departments of special prominence. It is a very useful volume to all readers, but particularly as a ready reference book for teachers, students, and editors.

READY FOR BUSINESS; OR, CHOOSING AN OCCUPATION. A series of Practical Papers for Young Men and Boys. By GEORGE J. MANSON. 12mo, pp. 108, extra cloth binding, price 75 cents. New York: Fowler & Wells Co., Publishers.

This is an educational book from a phrenological point of view, but presents what may be called an inside view of the various trades, businesses, and professions which are attractive to the youth, considers the opportunities afforded by each, shows what is to be done in order to acquire a knowledge of them, how much education is necessary, and how it can be

obtained, the opportunities for employment and the chances for success. The following are some of the important subjects considered: The Electrical Engineer, the Architect, Commercial Traveller, Banker and Broker, House Builder, Boat Builder, Sea Captain, Practical Chemist, Journalist, Druggist, etc., and the learned professions—Medicine, Law, and Divinity. The author does not attempt to indicate which is the best line to follow, but rather to show what is to be done and how to do it, to enter upon any one life pursuit, so that when a young man has the matter under consideration he may know with what he has to contend in order to succeed.

ALDEN'S MANIFOLD CYCLOPEDIA OF KNOWLEDGE AND LANGUAGE. Vols. XIII., XIV.; pp. 632, 632, Electricity—Floyd. These volumes comprise several very interesting topics, not the least of which, by any means, the first, followed by Electric Light and other applications of electricity, to which forty-four pages are devoted. Elizabeth, England, and English Literature; Fire-arms, Fire-Engines, Fire-Escapes, and Fireproof Buildings, are some of the longer articles, which best serve to show the excellence of the work as illustrated by its fulness of detail up to most recent dates. These volumes, as those which have preceded, are fully illustrated. Fifty cents a volume. New York: John B. Alden, 393 Pearl Street.

THE CLIMATE OF THE EASTERN SHORE OF MARYLAND CONSIDERED WITH REFERENCE TO ITS SANATIVE AND CURATIVE INFLUENCE IN PULMONARY CONSUMPTION AND OTHER DISEASES. By C. W. CHANCELLOR, M.D., Secretary of the State Board of Health of Maryland; Member of the American Public Health Association; of the Medical and Chirurgical Faculty of Maryland; Honorary Fellow of the Society of Sciences, Letters and Art, of London, etc. Pamphlet, pp. 116. Baltimore: Walworth & Co.

This is a good description of the upper portion of the peninsula extending between the Atlantic Ocean on the one side and Chesapeake Bay on the other, comprising somewhat of the good living and good habits of the people and their consequent relative healthiness, due for the most part, however, to the combined influence of an ocean and pine-forest atmosphere.

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INTERNATIONAL COMITY IN STATE MEDICINE.

READ IN THE SECTION OF STATE MEDICINE AT THE FORTIETH ANNUAL MEETING OF THE AMERICAN MEDICAL ASSOCIATION, JUNE 25TH, 1889.

By JOHN B. HAMILTON, M.D., LL.D., Supervising Surgeon-General U. S. Marine-Hospital Service.

THE last Quarantine Convention held in this country was held in Montgomery, Ala., March 5th, 6th, and 7th, 1889, pursuant to a resolution of the Alabama Legislature. The conference was largely attended, and although called for the purpose of considering quarantine alone, the meeting resulted in the formulation of some well-known principles of sanitation, but which, not having been codified, were, nevertheless, in a somewhat nebulous state. Among other propositions the conference agreed to the following, which I here recite as the text of this paper :

"*Resolved*, That this conference is of opinion that it is a duty devolving on all nations to take measures to eradicate any plague centre from their territory, and that the existence of such plague centres is a menace to all other nations, and that our State Department be requested to take measures through proper diplomatic channels for the conveyance of this opinion to the Governments deemed obnoxious to the opinion as herein expressed."

The medical part of international law is a recent creation. The international sanitary conferences that have been held in Paris, Constantinople, Vienna, Washington, and Rome, have successively been the arenas where these questions have been discussed, and so far there has been little result, if we except

the international quarantine maintained at the Suez Canal by the French, and the Consular system of notification inaugurated by the United States. At these conferences, with all the conservatism underlying the action of diplomatic representatives, the views of the technical delegates, while not always fully adopted, have not seemed too radical, and the mere fact of the calling together of these conferences, is itself proof that nations are now acting in formal recognition of the necessity of a new chapter in the International Sanitary Code.

I speak of the "international law," although it is well known that "there is no legislative or judicial authority, recognized by all nations, which determines the law that regulates the reciprocal relations of States." (Wheaton.) But there are interpretations of the *jus gentium* which, by common acceptance and long usage, have been the guiding principles on which diplomatic disputes have been settled for many years.

Without entering upon the question of whether it is strictly correct to use the term *law* as applicable to mere rules governing the conduct of independent nations with one another, we may, at least, admit that there are certain moral obligations resulting from natural rights, which nations at peace respect and observe. Mr. Madison defines international law as "consisting of those rules of conduct which reason deduces as consonant to justice, from the nature of the society existing among independent nations, with such definitions and modifications as may be established by general consent." (Wheaton.)

"To this favor, then, we come at last" in discussing this question, that whatever is done or admitted, is by general consent. Most of the terms of the international law have been settled by treaty.

One of the *absolute* rights of independent States resting upon general consent and common usage, and acknowledged as the most important, is the right of self-preservation. "This right," says Wheaton, "necessarily involves all other incidental rights, which are essential as means to give effect to the principal end." It follows logically, that preservation from epidemics falls within the rule, and a nation should have a right to view as equal acts of hostility the sending out of a piratical craft, or of a ship infected with yellow-fever, cholera, or other contagious disease. That division of commerce

known as the carrying trade, is too impatient of sanitary restraint ; it should be stripped of its power to convey disease, and by international treaties the carrying trade may be so regulated. There need be no interference with shipping. Modern machinery of disinfection has taken the place of "detention." But even this regulation will not go to the root of the evil, for the existence of a plague centre in any country is a constant menace, and the carrying of fomites may sometimes escape the utmost vigilance.

Therefore it seems that the *jus gentium* requires that any nation having within its territory an agency capable of destroying or injuring another, suppress that agency. This is not a strained interpretation, for we may find the general principles recognized in the restrictions placed upon a neutral. A neutral must restrain from fitting out, or sailing of armed cruisers of belligerents, and must prevent their territory from being made the base of belligerent operations ; not only that, but a reasonable vigilance must be exercised. (Wharton, "International Law Digest.") And further it was claimed, and the claim has been admitted, that it is the duty of the sovereign of any country to restrain agencies likely to injure another country, such as by predatory Indians or other marauders, or mob injuries. (Wharton, *loc. cit.*) The diversion or obstruction of navigable waters without the consent of the injured nation, has also been successfully claimed as a violation of international rights. Why, then, should not the claim be insisted upon, that under the absolute right of self-preservation, we shall demand of certain other countries that reasonable diligence in suppressing small-pox, yellow-fever, and cholera be displayed by those nations owning disease-breeding foyers.

There has been a great increase in the comity between nations in regard to sanitary matters in the past few years. The first step is clearly that inaugurated by the Vienna Conference of 1874, where the danger of cholera importation having been recognized, by general consent, the French Government took charge of the quarantine service at the southern entrance to the Suez Canal, since which time cholera has not passed beyond Egypt. It is true that cholera appeared in Europe in 1883, but it came by a different route, *i.e.*, by

French troop-ships from Tonkin, and the disease was thence disseminated to Spain, Italy, Sicily, Sardinia, and South America.

The next important step in international sanitation, I am glad to say, was taken by our own country. Dr. John C. Peters, of New York, in a letter written to the late Surgeon-General Woodworth shortly after a visit to Havana, wrote that "an international public sentiment should be created against the filthy and careless ways of the authorities, which cause so much suffering and death among the mercantile and public navies of the whole world." ("Woodworth on Quarantine, Transactions International Medical Congress of Philadelphia, 1876," p. 1068.) That officer (John M. Woodworth) in a report to Congress in 1874, had invited attention of Congress to the necessity for "prompt and authoritative information to threatened ports of the United States of the shipment of passengers or goods from a cholera-infected district," and he suggested that the Consular officers of the United States should be instructed to place themselves in communication with the health authorities of their respective localities, and to advise promptly, by cable, of the outbreak of cholera, and the sailing and destination of any vessels carrying passengers and goods from infected districts. This suggestion, so eminently practical, was finally adopted by Congress in the law of April 29th, 1878, which now forms the basis of our existing Consular sanitary regulations. Through the kindness of the honorable the Secretary of State, and the courtesy of the efficient chief of the Consular Bureau, I was permitted to recast the last revision of the sanitary portion of the Consular regulations (1888), and I am of opinion that our regulations on this subject are at present in advance of those of any other country. The *Bureau Consultatif d'Hygiene*, of Paris, in its last report, invited the attention of the Minister of Foreign Affairs to these regulations, and recommended that the French Consuls receive similar instructions. Our Government has gone much further in this direction. We have employed a competent inspector in Havana since 1879, who is attached to the Consulate as medical adviser, and who makes personal inspection of the shipping bound to the United States, and who attends to the sanitary welfare of American vessels in

that port. When the cholera became epidemic in Europe in 1883, by my recommendation, a medical inspector was attached to the Consulates at Liverpool, London, Havre, Bremen, Hamburg, Marseilles, and Naples, who, under instructions from the Bureau, made careful inspections of emigrants, baggage, and merchandise bound to the United States. No government has yet protested against these inspections, except Spain, which country took exception to the continued presence of the United States Inspector in Havana, but that powerful country withdrew the objection when it was pointed out that, without such preliminary inspection, under municipal regulations of our ports, the carrying fleet would be greatly delayed, and at some ports shut out altogether during the summer months.

Our national quarantine laws are now much more rigid than heretofore, and year by year the stations are becoming more completely equipped, but much trouble would be saved, and danger avoided, by enforcing the international rule now asked as a right.

What excuse can exist for apathy in countries where yellow-fever and cholera are respectively epidemic? It is not a friendly act for a nation having a contagion-breeding centre, to fail in the exercise of such vigilance as might prevent the emanation of the disease germs.

I again quote Woodworth (*loc. cit.*): "The endemic homes of cholera and yellow-fever are the fields which give the greatest promise of satisfactory results to well-directed and energetic sanitary measures, and to this end an international sentiment should be awakened so strong as to compel the careless and offending people to employ rational means of prevention."

In the volume by Dr. E. C. Wendt, of New York, on "Asiatic Cholera," New York, 1885, I wrote concerning this subject: "A national government . . . during its existence as a government, must assume certain responsibilities, among which are those affecting the physical and pecuniary welfare of the people. A government must, under the natural limitations of human rights, take proper and necessary measures to protect its subjects against pestilence or famine by such wise and prudent acts as the necessities of the time may seem to warrant. A failure so to do would subject such a government

in the eyes of all civilized peoples to just condemnation, and as the safety of nations makes them mutually interdependent, whether they will it or not, so the safety of a particular nation is dependent upon the physical integrity of its several municipalities, as well as upon the physical integrity of its neighbors. . . . Modern nations have tacitly recognized these responsibilities, and endeavored to meet them by ‘international conferences,’ rarely, however, with any view to mutual concession. At each ‘conference’ thus far held, the commercial phase of the question has, although purposely kept in the background, seemed to be paramount, and although there has been substantial agreement, first as to the responsibility of any nation having epidemic disease within its borders, that such disease should not be allowed through negligence to afflict its neighbor; and second as to the desirability of a synchronous united effort looking toward final eradication; yet the moment the details by which these desirable ends were to be attained were discussed, harmony was at an end, and so it has happened that each nation for itself assumes its own responsibilities toward its citizens, and allows its neighbor to adopt in turn such independent measures as in its judgment the occasion warrants. . . . It is, therefore, clear that international public sentiment must be created to compel those nations owning cholera and yellow-fever centres to no longer afflict the globe by their apathy and indifference to the general welfare. . . . Who can doubt that if the action of Russia in respect of the plague, and of the United States in regard to yellow-fever, were imitated by Great Britain, Burmah, and China, as regards cholera; Spain, Brazil, Central America, Mexico, the West Indies, and the Occidental littoral of Africa, in regard to yellow-fever, that those two diseases would speedily disappear from the earth?"

There is, then, a plain duty before this great Association which embodies the combined medical wisdom of the United States, and that is to lend its powerful aid toward the humanitarian side of this great question. Let this Section reaffirm the Montgomery resolution, and commend it for adoption by the Association. Its object is to enhance the welfare of humanity, and its accomplishment is within the bounds of possibility.—*Journal of the American Medical Association.*

OUR CLOTHES.*

By Lucy M. Hall, M.D., of Brooklyn, N. Y.

Of all God's created beings the only one whom he has neglected to clothe is man.

This omission upon the part of his Creator at once separates and distinguishes man from all other living creatures. At the same time it has rendered it necessary for him to provide himself with some artificial covering in place of the hair, fur, feathers, or resisting epidermis which the inferior animals possess as a natural appendage.

The importance which attaches to this hyper-external portion of our bodies is not of recent date.

Beginning with the story of our first parents, we find all through the Scriptures mention made of the various garments and adornments of the men and women who figure there. The rainbow-hued coat of Joseph, the gorgeous apparel of Judith, even the far from frivolous garb of John the Baptist have all been deemed worthy of record in sacred history.

The fact is that our clothes, through association, become a part of us, help to identify us—even in some peculiar reactionary way serve to gauge or control our mental states.

The felon feels a degradation in his prison stripes which he could never understand in his ordinary dress.

The action of the young lady who repudiated a perfectly courteous assumption of acquaintanceship upon the part of a gentleman, because she had "only met him in her bathing suit," was grounded in a true psychological principle. She was not the same person in a brine-soaked apology for a society garment which she was in her conventional attire.

Let the most brilliant gentleman in a drawing-room suddenly perceive that his boots are muddy, or that his cravat is awry, and the chances are that he will become awkward and tongue-tied.

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* Read at the Brooklyn Institute, "On the Promotion of Health," in connection with the Health Exhibition, November 8th, 1889.

In one of Lord Beaconsfield's novels a fashionable tailor is made to say: "You must dress according to your age, your pursuits, your object in life. I am dressing two brothers now, men of considerable position. One is a man of pleasure, the other will probably be a minister of State. They are as alike as two peas, but were I to dress the dandy and the minister the same it would be bad taste; it would be ridiculous. No one gives me the trouble that Lord Eglantine does; he has not decided whether he will be a great poet or prime minister. 'You must choose, my lord,' I tell him. I cannot send you out looking like Lord Byron if you are to be a Channing or a Pitt." Lastly, he adds, "All men should avoid the shabby genteel. No man ever gets over it. You had better be in rags."

That the great statesman had a most vivid comprehension of the effect of clothes, both upon the wearer and the observer, is manifest not only in the language of his novel, but in the extraordinary costumes he affected during almost his whole life.

The desire to inspire awe is expressed in the robes of the monarch, the priest, the judge. The war paint and feathers of the Indian brave, as the gaudy trappings of the soldier, tend to the mental exhilaration of the wearer and the subjugation of the beholder.

To heighten personal charms is another controlling factor in the choice of clothing. To modify or conceal deformities is still another.

Coarseness or refinement of nature finds expression in apparel as in no other way; and consciously or unconsciously what he wears is accepted as an index of a person's character.

The desire to display money values in attire is with some people an incentive to extravagance in this regard.

Then there are garments of humility and abnegation, as those of the Quaker and the nun, and again, garments of sorrow and garments of joy. As the wearers jostle each other in the streets, we seem to hear the dull thud of earth upon the coffin-lid mingled with the merry clang of wedding bells.

In the vagaries, absurdities, extravagances, and distortions which have resulted from the various impressions which man has sought to convey by his outer covering, the great primary

necessity for clothing has been almost lost sight of. This necessity is protection ; protection from observation, protection from cold, from heat, from wet, from injury in various forms.

Comfort, convenience, hygiene, and agreeableness to the eye should all be regarded as necessary accessories. These, too, are largely lost sight of or ignored, because of the perversions of taste and obedience to customs which have grown out of centuries of abuse.

The materials chiefly utilized for clothing are cotton and linen of the vegetable substances ; skins, hair, wool, silk, down, feathers, of the animal. Minerals, as metals, glass, and various stones, are much used as ornaments. Cotton, wool, linen, and leather are the most abundant and useful materials, and they form the principal part of the clothing of the great mass of the people.

Air is, as we all know, a bad conductor of heat and of electricity. So the warmth and electricity of the body are conserved by a covering which contains much air in its fibres. Water, on the contrary, is a good conductor of heat and electricity, and just to the degree that the air in the interstices of any material is displaced by water it becomes a vehicle for the rapid conduction of these away from the body. Woollen holds a larger quantity of air among its fibres, and will transmit through them a larger quantity of moisture without displacement of the air, than any other material. Silk stands next in these respects.

Woollen clothing is especially adapted to the needs of man.

In the Jaeger and the Warner systems, the natural wool is carefully cleansed, and without being dyed or bleached (either process hardening the fibres somewhat) is spun and woven into fine, soft, elastic cloth.

In the Warner system about forty per cent of camel's wool is used in the finest grades of the goods.

The underwear of both is of the stockinet weave, and so delicate and soft that, while it somewhat stimulates the skin, it seldom irritates it.

If washed according to Dr. Jaeger's directions it is said not to shrink and grow hard. Any woollen garment which has so shrunken and hardened is unfit for further use, and especially so if it be an undergarment.

Silk possesses a certain advantage in that, as a rule, it does not shrink and lose its original qualities in washing.

In a moist and changeable climate like ours, where rheumatic affections, catarrhs, sensitive throats and bronchial tubes are so prevalent, an especial effort should be made to maintain a healthful equilibrium of the temperature of the skin. To effect this, woollen or silk underclothes should be employed summer and winter. Not a patch of an undervest, covering neither chest, shoulders, nor limbs, but a garment which shall clothe these as well as the trunk.

A lady with one thickness of linen over arms and shoulders will tell you that she is half dead from the heat. The thermometer stands at 96° in the shade. You place your hand upon the perspiring skin ; it is clammy and cold. A poor sufferer, her joints swollen with rheumatism, said to me on a hot summer's day : "I perspire so, and suffer so terribly from the heat, that it is as hard to bear as my illness." The touch of her skin chilled me like wet ice. "You should wear light woollen or silk garments next your skin," I said ; "no half-way business, but all over, from neck to wrists and ankles." I had hard work to convince her that she would be made more instead of less comfortable by doing as I advised, but I finally succeeded and with the happiest results.

There is great variation in the amount of clothing which different people require. Some seem to be almost insensible to cold ; others, like poor Harry Gill, their teeth they chatter, chatter still. Special directions must therefore apply to special cases ; but certain broad rules can be laid down for all.

Light woollen or silk underwear, suitable for midsummer, is not warm enough for spring or fall wear ; and for winter a still heavier grade is needed. Partially-worn winter garments can often be wisely utilized for intermediate service ; otherwise new ones of suitable thickness should be provided. Many persons make the mistake of wearing undergarments in winter which are *too* thick. These are likely to be all of woollen material which, very closely woven and very heavy to begin with, has shrunk in the washing. They impede the healthful interchange between the air and the transpirations of the skin ; the latter reabsorbs into the circulation the poisonous matter which it has essayed to throw off ; it exhales a peculiar sickly

odor; the cutaneous nerves lose tone and action; they convey their disturbed impressions to the great centres, and all portions of the nutritive and eliminative systems suffer in consonance.

I have seen the most depraved physical conditions result from the wearing of very heavy, closely-woven flannels, which, after a few washings, had become almost impervious to air and moisture.

Too little clothing is equally bad. It prevents free action of the skin, which is constantly being chilled, and the vitality is lowered by the draughts made upon the internal heat in its efforts to resist the external cold.

Also the body should be *evenly* clothed, instead, as is often done, especially by women, the clothing being massed upon the trunk and the limbs left half clad.

Many ladies wear low-necked and sleeveless undervests, so that they shall not feel the change so much in *décolleté* dressing. This course is a constant menace to the health, and the danger is doubled whenever the baring process is carried out. The custom, except in its most moderate indulgence, is reprehensible from every point of view.

It is, perhaps, needless to say that "cleanliness is next to godliness," especially in the matter of underclothing.

The changes should be frequent enough to prevent any possibility of an unhealthful accumulation of the exhalations and exfoliations from the skin.

Two changes per week in cold, and daily or bi-daily changes in warm weather are pretty good rules, if varied to suit especial conditions.

Night and bed clothing deserve particular consideration.

About one-third of our time is spent in bed.

Under the warm bed-covers the activity of the skin is increased and its exhalations must make their way to the free air of the room or the sleeper suffers; at the same time he must be kept warm and comfortable; therefore lightness, warmth, ventilation are required if the rest is to be perfect.

For the person a vest of some light, soft, woollen material, which has not been worn during the day, and a night robe, both of a thickness suited to the season, should be worn.

With bed as with other clothing, the greater the bulk, in

proportion to fineness of fibre and lightness of weight, the greater the warmth. Down and feathers are light, but are too warm for bed-covers in our climate and they allow too little ventilation. A down comfortable thrown across the feet in very cold weather is not objectionable. Soft new woollen blankets in cold weather, one placed between the sheet and the hair mattress, and as many as are required for covers, are the best bed clothing. It is well to have woollen sheets where they can be afforded.

Cheese cloth or silk comfortables are good if they are so quilted or tied that the cotton portion is separated by the threads, and ventilation thus made possible.

All waterproof garments have the disadvantage of keeping the moisture in as well as out, and when we remember that the insensible perspiration of the skin amounts to about two pounds per day, we can but see how rapid must be the accumulation of this moisture when its escape is prevented. If brisk exercise is taken under a waterproof garment, the perspiration is increased and the drenching from the inside is often greater than it would have been from the outside moisture.

Even the best-ventilated waterproof garments do not obviate this difficulty.

If you are obliged to stand or sit out of doors in a heavy rain, then you may wisely protect yourself by wearing a waterproof. If you are walking and the wind is too obstreperous to admit of the use of an umbrella, wear a waterproof and make the best of it ; but in general put on a woollen wrap and trust to a good large umbrella to keep you dry.

Waterproof wraps are now made in such pretty colors and fashions that many ladies wear them when there is only a hint of rain in the air. In these cases, the " ounce of prevention" is the prelude to the " pound of cure."

Waterproof lined with woollen, and a kind of woollen goods so woven as to be nearly waterproof, are, for obvious reasons, preferable.

Fur combines the advantages of woollen with the disadvantages of waterproof garments. The soft, fluffy fur holds an abundance of air, but, combined with the skin portion, it is too *impervious* to air and moisture for perfect hygiene.

Any long or closely-fitting garment of fur is objectionable if worn when exercising.

The skin, from a kind of smothered warmth and maceration which result, loses its natural tone and resistance, and the wearers take cold if they stir out of doors without the accustomed fur wrap, no matter how warm the winter or early spring day may be.

For driving in very cold, or raw, windy weather, fur garments are especially useful. In our climate it would be better if they were employed for this purpose only.

Fur worn too closely about the throat will make it sensitive and liable to catarrhs and inflammations.

For muffs, cuffs, collars, etc., it is as useful as it is beautiful. It is as graceful and comfortable a complement to a gentleman's overcoat as to a lady's cloak ; and why so few gentlemen avail themselves of the real comfort and æsthetic pleasure to be derived from the wearing of a handsome fur-trimmed overcoat I *cannot understand.*

Some degree of beauty in apparel is to many persons a necessity.

Carlyle says : " The first purpose of clothes, as our professor imagines, was not warmth or decency, but ornament."

A lady of refined tastes but limited means was travelling for her health. I met her during the time and was pleased to find her so much improved ; and, taking the liberty of an old friend, I remarked upon the extremely neat and becoming costume which she wore.

She laughed and told me that she had been absolutely obliged to get it, because she became so low-spirited in the old one, of which she was tired, and which, at its best, she had never liked ; " and," she added, " I began to improve directly after the change and have kept it up ever since."

I have many friends who tell me that their most infallible cure for weariness and blues is to go and dress up in one of their prettiest gowns. And many gentlemen will tell you that a clean shave and fresh linen are most reviving and soothing in their effect upon the psychical and physical man.

" The history of fashion is the history of folly," says a wise man ; and the history of fashion is almost confined to that of clothes.

Women, as a rule, devote more time and attention to dress than men, although in many periods of the world's history the extravagances, absurdities, and inconveniences of the costumes of the sterner sex far outrivalled those of the weaker.

In the early part of the fourteenth century there was a culmination of follies, and we are told "that the dress of men became most ridiculously" and preposterously "exaggerated." Some had their clothes made so tight that it required the help of two men to dress and undress them, and while the latter process was going on they appeared as though being skinned. In other cases their robes swept the ground. For a dandy's cloak twenty-seven hundred and ninety ermine skins were required, while the toes of his shoes measured twice the length of his foot, and were ornamented in the most fantastic manner. It is also recorded of this period that, "while male attire had extended to the utmost limit of extravagance, women's dress, on the contrary, aimed toward a dignified and elegant simplicity."

And even now—rash and unheard-of statement—women are not in one-half the slavish subjection to fashion that men are.

Of fifty gentlemen at an evening party, all are dressed so nearly alike that, if they were of the same size, every man of them might exchange clothes with his neighbor and no one be the wiser; while the grammar test is often the only means of deciding between a guest and a waiter.

Can any one imagine a more complete renunciation of individual taste than this, except it be under monastic, military, or some kindred rule?

Yonder dignified, white-haired judge must appear in garments almost identical with the young dandy of twenty beside him. And be he fair or be he swarthy the poor man is allowed no choice of colors.

A young gentleman who not long ago attempted to enter an evening drawing-room in a sash, instead of the regulation vest, was warned off the premises and his name bruited about in the newspapers.

Every person should be privileged to give to the world some individual expression of himself through his apparel.

The black-eyed Oriental who sells sandal-wood and Smyrna

rugs at the bazaar would not be half so handsome but for the rich maroon of his cap and gown.

That the soul of the nineteenth-century man longs for the sanction of inexorable custom, for a little variety, is shown by his evident delight in any gay and gorgeous apparel in which he is permitted to appear.

In the court circles of Europe the splendid and variously colored uniforms of the men, their glittering orders and decorations, held in place by brilliant-hued ribbons passed about the neck, across the breast, sometimes dangling to the very knees, are worn, to state the case *mildly*, with a very evident degree of satisfaction. And the eager way in which a man asks his neighbor, "Are we to wear our decorations this evening?" could not be outdone by a young beauty when preparing for her first ball.

This is no adverse criticism upon the sterner sex. On the contrary, I look upon it as all very right and natural, and I believe that the repression of these instincts, as is so nearly done in America, is altogether wrong and abnormal in its tendencies.

It is largely from this cause that that modern weak-brained monstrosity, the dude, has been evolved. Poor fellow! He wants to revel in unlimited finery, but he is hedged in by such adamantine walls of custom, and such inexorable rules of fashion that, beyond a few silly exaggerations, he is helpless, and so harassed and tortured beyond endurance, he sinks into a state of semi-imbecility, and finds his only comfort in confiding his woes to the head of his cane.

To be sure, there is in the choice of business and informal reception dress *some* latitude allowed. There are also yachting, hunting, and bycycling suits which admit of some variety. Then, too, I know of at least one New York man of fashion who, as a kind of safety-valve for his æsthetic taste in dress, has provided himself with smoking-robes, sleeping-robes, dressing-robes, breakfast-robes, etc., by the dozen. The choicest fabrics, the most brilliant dyes, the richest devices in embroidery, the daintiest and most exquisite workmanship of the cunning artificers of the Orient and the Occident have all contributed to satisfy the longing of this man for beautiful apparel.

Why must all these gracious and gorgeous envelopes, in which the character of the owner has sought for an outlet of expression, be shut away in the SMOKE-LADEN atmosphere of a bachelor's den, and he be forced to appear in the guise of "a *crow*, with a bib on," whenever he goes into "society?"

Perhaps it is because, if allowed full liberty, the frenzy for finery would so seize upon, occupy, and demoralize the masculine mind, that a repetition of the follies enacted in mediæval times might be expected—who can tell? Even now the worry over the size of his stick, the adjustment of his scarf-pin, the width of his shirt bosom, drives many a young gentleman almost to the verge of distraction at the beginning of every season. What *would* he do if he had the FURbelows of a woman to determine upon?

Mr. Benjamin Ward Richardson says: "In speaking of dress and health, I must be allowed to criticise, if not to scold, and rarely, indeed, to find one passing word which stands for commendation." In this, I think, no one can dissent from his opinion. But even in making the most sweeping criticisms there is always a margin of reservation, expressed or implied, for those who have deferred to both hygiene and good taste in their apparel, and there are many such.

The comfortableness of our clothes depends very much upon the models after which they are constructed and upon their weight.

We become inured to disagreeable, even painful sensations from a loss of nervous sensibility, and a kind of physiological toleration being established, even though the cause is not removed.

Perhaps there is no article of dress which causes more discomfort to both men and women than shoes.

"It is amazing," says the author of "Rab and his Friends," "the misery the people of civilization endure in and through their shoes. Nobody is ever, as they should be, comfortable at once in them; they hope in the long run, and after much agony, and when they are nearly done, to make them fit, especially if they can get them once well wet; so that the mighty knob of the big toe may adjust itself and be at ease. Why do you see every man's and woman's feet so out of shape? Why are there corns, with their miseries and maledic-

tions? Why do nails grow in and sometimes have to be torn violently off? All because makers and users of shoes have not common sense and common reverence for God and his works, enough to study the shape and motions of that wonderful pivot on which we turn and progress. Because fashion says the shoe must be elegant, must be so and so, and the beautiful, living foot must be crushed into it, and human nature must limp along Prince's Street and through life natty and wretched."

We are all only too familiar with these miseries, and when they are aggravated by the wearing of high-heeled and narrow-toed shoes, the feet are tortured into every form of affliction which can assail these long-suffering members. The natural spring of the arch also, thus being destroyed, the spinal cord and brain are subjected to unnatural jar, the body is tilted out of its normal axis, and altogether, walking in comfort is made so nearly impossible that but little walking is done.

Happily a decided reform in street boots has been adopted by many ladies of fashion; easy, low-heeled shoes are in favor for vacation *negligé* with both men and women. Still, narrow-toed shoes are much worn by both sexes, and these, with the accompanying high heels, are clung to by the mass of women.

The shoe should follow the natural outline and level of the foot, giving the toes room to spread when walking. The soles should be ventilated by a small opening just at the back of the heel, and the inner sole should be of woollen or thin, soft, perforated leather laid over the woollen, so as to absorb the perspiration. Many cases of habitually cold, clammy feet are cured by the wearing of such shoes.

The best test of the discomforts and inconveniences of our attire, would be to take an untamed Indian of the plains and subject him to the adjustment upon his own person of the various articles worn by civilized men and women.

In knickerbockers, a flannel shirt, soft hat, long stockings and easy shoes, or a loose tennis, or gymnastic dress, he would probably find that existence still had charms for him. The conventional business suit of man, with its hard hat, stiff collar, and unyielding shoes, would probably extort a few yells of agony. The suspenders would hurt, the coat would perhaps cramp and annoy, but life would be endurable to him.

Then put him into the garb of woman—feeble, delicate, gossamer woman—(who, by the way, ladies and gentlemen, has greater powers of endurance than any other animal on earth), into the tight corsets, which would jam his elastic ribs into his pendulous liver, his writhing stomach up against his wobbling heart and gasping lungs, his whole nutritive apparatus, up, down, backward, sidewise, anywhere, so that nineteen inches of steel and whalebone should compass his twenty-five-inch middle ; add the dozen or more articles, with their aggregations of bands, strings, buttons, hooks, loops, clasps, and pins ; place about him zone after zone of tight bandages, from which are suspended dozens and dozens of yards of gathered, puckered, pleated, and festooned material ; tilt his body all out of plumb by fastening under his heels a wooden peg two inches high, and crush his toes into the space of a good-sized thimble. Weigh him down with a long, heavy outside wrap, perch a bonnet upon his head, and stretch a dotted veil over his eyes, put his hands into tight kid gloves, and into these a pocket-book and an umbrella ; then send him out for business or for pleasure on a moderately wet morning or afternoon ; let him keep his long flapping skirts, his shoes and his ankles dry and clean, his feathers and bangs in curl and his temper unruffled. Then ask him when he gets back to you, if he lives to do so, which he would rather be—a lovely civilized woman or a howling savage—and see what he will say.

A gentleman said to me : " Starch is the bane of civilized man ; without starch he could be comparatively comfortable. In a flannel shirt there is happiness." Another says : " Nothing can be more ugly to look at, or disagreeable to wear, than a silk or any other stiff hat, to say nothing of the lining which poisons your forehead, and the circle of constriction which makes you bald." Another declares that his legs are nearly always half frozen in winter, and wishes that the English custom of gentlemen carrying a rug to spread across the knees might be adopted here.

A stalwart young fellow, who had spent three whole months tramping about in the White Mountains in knickerbockers, flannel shirt, soft hat, and easy shoes, told me that for three weeks after his return to *city clothes* he was utterly miserable, and his cramped and insulted muscles rebelled, if he attempted to walk more than a mile at a time.

And yet in spite of these harrowing testimonials, it is not to be denied that for all purposes of health and convenience, the dress of men possesses many advantages over that of women. Here fancy, folly, variety, monotony, good taste, and bad taste, are all mingled in one grand chaos and named fashion.

So great is the variety that no two women are ever seen dressed alike, except by some special rule or understanding; and yet if you were to meet ten thousand women upon the street on a rainy day, ninety-nine one-hundredths of them would be in draggled skirts and wet ankles.

But, we say, "this is unavoidable, since modesty and not fashion, demands that the skirt be of this inconvenient length." And yet a young girl of fifteen or sixteen may wear her skirts just down to her boot-tops without comment or question, and be neat and dry as well as modest. But the unhappy *woman* who, in desperation grasps her long draperies in her one available hand, as she approaches a muddy crossing, in her anxiety to save her dress from ruin, forgets the proprieties for which in her calmer moments she stoutly contends, and is all unaware of the exhibition which she forces upon a sensitive public. With a skirt two inches from the ground she would be infinitely more modest as well as comfortable.

Look at the army of working-girls who throng the ferries and the Bridge-cars every morning. The thin-soled, narrow-toed, high-heeled shoes, too often run over at the heel, thus adding further injury to the already injured and insulted foot. The pinched waists from which depend a mass of material weighted with braids, beads, or many-folded draperies, their frayed hems damp with the early moisture of the streets, and tell me what chance these poor girls, however earnest and capable, have against the odds with which they are contending, and which the tyranny of fashion imposes.

Here is a young girl, bright and ambitious. She is about to enter a college for the higher education of women. After her graduation she intends to adopt a profession—teaching, medicine, or literature. And she quite properly makes a little mental reservation in favor of the *right man*, if he should happen to appear.

She is now going into the hands of the college doctor and

one of Dr. Sargent's trained gymnastic teachers for examination, measurements, etc. She is clothed after the manner of the majority of her sex; the limbs half protected, the waist constricted by corsets and bands and dragged upon by long, heavy skirts, and as you look at the girl, the promise in her face is contradicted by the slender body, so mercilessly exposed, distorted, and weighed down.

When we remember that thousands of just such bright, aspiring girls are clothed as she is clothed, a sense of rebellion takes possession of us. Why must these girls be so dressed that not an organ of their bodies can have a free natural action? Why must they be weighted, cramped, trammelled, tripped, wearied, exasperated in every exigency of active life? Why must the best physical and mental development of the race, which they are to perpetuate, be hindered and sacrificed to these senseless customs? This vast and overshadowing evil I can only touch upon here.

The one great step toward the emancipation, so called, of woman, is to emancipate her from the more glaring evils which are found in her mode of dress. The one great step toward securing the highest possibilities of the race is here. A few, with pluck and courage and exceptional vigor, will modify their unwieldy envelopes and succeed in spite of them, but all along their course they will see and minister unto thousands who might have done noble work for brave reward, could they have conserved their strength for this, instead of dissipating it upon a needless burden of clothes.

We talk to our college girl: tell her of the dangers to delicate organs (congestions, catarrhs, etc.), because of the sparsely-clothed limbs, of the augmented dangers when wet skirt-bottoms are allowed to come in contact with feet and ankles, of the injuries which result from pressure and undue weight at the waist.

We feel deeply, and the girl, carried away by our enthusiasm, decides to dress more hygienically. We give her explicit directions, but she is in a hurry and naturally begins by leaving off her corset. She has not provided herself with combination undergarments or waists, to which she can button her skirts, so she pins or ties her now tightened bands about the yielding tissues above the hips, or suspends them by slender

straps passed over her delicate shoulders. She is miserably uncomfortable, takes cold from the absence of the corset to which she has been accustomed, and the thinned and weakened muscles of the back almost refuse to hold her in the upright position. She struggles on for a day or two, then goes back to her old enemy, the corset, convinced that though she *may* die with it, she certainly should die without it.

Another girl provides herself at the outset with whatever is necessary for the change, makes it, is delighted with the results, goes home for a few days prepared to convert the whole family and the world, if necessary, and comes back dressed as we first saw her. A fashionable mother has pronounced her a fright and bundled her back into corsets, tight dresses, and all the rest of it. Health with such mothers is an altogether secondary consideration.

One girl in fifty will make the essential changes, adhere to them, and live a happier and healthier woman ever after.

Dr. Sargent, in an article upon "The Physical Development of Women" (which should be read by every man and woman in Christendom), has demonstrated by careful experiment, that after taking a certain amount of active exercise, the heart impulse was *increased* to one hundred and fifty-two beats per minute when no corsets were worn, and to one hundred and sixty-eight per minute when corsets were worn. He adds: "One can form some idea of the wear and tear upon this important organ (the heart), and the physiological loss entailed upon the system in women who force it to labor over half their lives under such disadvantages as the tight corset imposes."

By the spirometer (or lung test) the average lung capacity when corsets were worn was one hundred and thirty-four cubic inches; when the corsets were removed the test showed an average lung capacity of one hundred and sixty-seven cubic inches; a gain of thirty-three cubic inches. "Who can estimate its value to the entire system? Why preach the gospel of fresh air to women who deliberately throw away twenty per cent of it by the use of tight stays or corsets?"

Reference is then made to the malnutrition of all parts of the body in consequence of interference with the circulation.

Of pressure upon the stomach, liver, and other abdominal

viscera, he says: "Could my fair readers know the importance of the organs displaced and compressed by the tight waistbands, and the part they play, not only in administering to the welfare of the body, but in influencing thoughts and feelings and really enhancing life's pleasures, they would certainly need no argument to convince them that it would be worth while to give these agents a fair chance to perform the work that nature imposes upon them."

Any woman is dressed too tightly when, in taking a full breath, the expansion at the waist-line is interfered with.

Dr. Dickinson, in an admirable little pamphlet, has shown the manifold evils of corset-wearing in a most explicit and convincing manner. Even though the corset be not tight he demonstrates that the downward and backward pressure of the steel and the consequent displacement of the abdominal viscera, especially when the wearer sits or bends forward, is the source of grave injuries.

I know of one noted throat specialist in this city, who so fully recognizes the derangement of the vital action of the system from the use of corsets, that he absolutely commands his lady patients one and all to leave them off.

Dr. Sargent also writes: "As for skirts, what shall we say of them? They have hampered the progress of civilized woman for three thousand years."

This is true, and yet it need not continue to be so. To begin with we like our skirts and we intend to wear them, but there is no reason why they may not be so modified as to be suitable for any and every occasion.

There are times and seasons when even a trailing skirt is no more objectionable for a woman to wear, than the flowing robe of the prelate or judge is for a man; but for business hours, why in the name of *common sense* cannot women adopt a sensible, comfortable business dress? It is needed by the millionaire's daughter, who takes her morning walk down Fifth Avenue at ten o'clock, as much as by the shop-girl who hurried down Sixth Avenue three hours earlier.

There is no objection to a woman making her dress for all occasions of ceremony, or for the home, as pleases her fancy; and it may be as sumptuous as her means will allow, health, and, must I add, modesty, always being deferred to.

She will all the more enjoy her finery for having worn a dress during the hours when she required it, which was suited to the whirl and rush of the crowded thoroughfares, the busy, hurrying life of a great city hard at its day's work.

We daily see upon our streets many ladies whose apparel is almost perfect in its simplicity and its adaptation to time and place and the pursuit of the wearer.

Many of these have in all respects conformed to the best hygienic models in all that they wear. Women of wealth and position are fortunately the leaders in these reforms and their influence is daily widening.

No better business dress for women could be devised than the Jenness-Miller system furnishes, with the one exception that the skirts are a *little* longer than they should be for perfect cleanliness, health, and safety to the wearer. Mrs. Miller knows this, but, wise in her day and generation, she makes a concession in order that the greater number may be induced to conform to the greater good.

Briefly described, the dress consists of a combination undergarment of soft silk or wool, another, to be worn over this, of any goods the wearer desires; extra drawers or divided skirts of material suited to the weather are worn instead of underskirts. All these snugly fastened to an easy, nice-fitting waist. A gown form extending from neck to feet, upon which the gown is made, completes the costume. The body is smoothly fitted everywhere, but compressed and weighted nowhere. Nothing could be more simple and comfortable for work at home or abroad than this, and nothing can be more beautiful and complete than her more ceremonious toilettes.

There is one kind of physical wear and tear in the matter of clothes which all *man*kind escapes. He may work himself into a frenzy because his tailor has not finished his new dress-coat in time, has made it too long in the body or too short in the skirts, or he may shatter his health in trying to satisfy the demands for sealskin and velvet of an extravagant wife, but of the omnipresent needle and the garments which must be made, mended, or altered, he is happily oblivious. Not so with the woman. Among all classes but the very wealthy this to her is a never-ending slavery. Women who have a multiplicity of household cares, girls who need much active

exercise, tired teachers, who should feel free as air when the school-room door closes behind them, shop-girls, saleswomen, typewriters, all spend hours of painful struggle over sewing when they should be exercising, reading, or sleeping. A spectre of unfinished garments follows them everywhere, and the pathetic phrase, "I have such piles of sewing to do," is always on their lips. An enormous amount of female vitality is wasted in this manner.

Then the young *bride* must have dozens of everything white, and stacks of everything of every other color. You would imagine from the outlay that she never expected to have another article of clothing during her lifetime. By the time her wedding-day arrives she is a nervous wreck, and she falls into her husband's arms a bundle of hysterics and millinery, with the chances that before the year is out her doctor's bills will amount to more than the price of the gorgeous trousseau for which she sacrificed her health.

A word in regard to the manner in which we Anglo-Saxons dress our young babies. It is atrocious, and why we have so long adhered to it is only to be accounted for upon the principle of the old Pennsylvania-Dutch farmer, who balanced the grist in one end of his sack by a bag-stone in the other, because "what was good enough for his father was good enough for him."

To put a poor little doughy scrap of incipient humanity into a series of petticoats a yard and a half long, with great wide bands, which must be pinned around the little body, while the helpless little head rolls about, and the weak little neck is twisted and stretched, is simply barbarous; and, "because our grandmothers did it" is no excuse for us.

All that is wanted is a bit of a soft wool or silk vest, then, while the baby is very young, an abdominal band fastened with three or four bits of tape, and finally a slip, reaching a quarter of a yard below the tiny toes, made of flannel, muslin, anything—single, double, or treble, at your pleasure, but which can be taken off in a jiffy and replaced by a clean, dry one whenever necessary. What an economy of mother patience and infant happiness! It is a good half hour's work to get a howling, kicking infant out of one of its present rigs and into another, and so the poor little amphibian gets on as

best he can and takes it out in making things lively generally.

The mother, full of a beautiful but mistaken sentiment, has probably spent weeks in stitching at dainty fabrics in the close atmosphere of her room (which are altogether unfit for a drooling baby), when by giving herself fresh air, sunshine, active exercise, and intellectual pastime, she would have been heaping up untold benefits for herself and her unborn child.

In the human mind there seems to be a demand for some outward emblem of *grief* after the death of a friend.

The wearing of black or white, letting the hair grow a prescribed length of time, the rending of garments, lacerating the flesh, putting dust and ashes upon the head, and abstaining from washing, are all among the mourning customs of different peoples. The modern savage paints his face black, puts soot in his hair, and goes about looking very dirty and dejected. Civilized man of the present day places a band of black crape around his best hat and faces the world in calmness and dignity, but civilized woman envelopes herself from head to foot in the dreariest of midnight robes.

Indeed this blackness of darkness in many cases pervades every article worn by day or by night, and in some instances the bed, the toilette-table, the windows of my lady's private boudoir, even the carriage robes, and not alone the coachman's livery, but the coachman himself, must, in hue, be in consonance with the doleful humor of his mistress.

Mourning apparel is unhygienic in that it is usually heavy; in summer it is almost unendurably warm. The long veil, which so often accompanies it, is a troublesome appendage, and, worse than all, the whole is depressing to the spirits.

Think of a home where a mother and two or three daughters, perhaps a grandmother and a maiden aunt, are all habited in mourning. Ugh! it makes one shiver to think of it. A merry-faced caller feels as though she had come to a funeral, and all the sparkle goes out of her eyes before she can cut her visit short and shut the door of the gloomy household behind her.

Little children feel the uncanny influence, and even the cat and dog are made dismal in proportion to their intelligence.

The enormous number of mourning costumes which we see

daily upon our streets is a doleful spectacle and a reproach to the medical profession.

Thus in all stages and ages of existence, from primitive man, with his draperies of verdant foliage, to the nineteenth-century belle in her shimmering robes, from the cradle to the grave, *our clothes* are a most important factor in the sum total of life.

Finally, the last garment of earth, the still, chill shroud is folded about us and the poor clay is habited for the last time, and yet, in the beyond, there awaits the spotless robe, the shining crown, the celestial garments of the soul, and the real, the only living part of man stands at last forever clothed.

THE RELATIONS OF THE DWELLINGS OF THE POOR TO INFANT MORTALITY.*

By Alfred C. White, C.E., of Brooklyn, N. Y.

THE poorly-constructed and badly-arranged houses which too frequently have to form the homes of the working-classes have been long recognized as among the prominent causes of excessive mortality, and especially of infant mortality, in many large cities here and abroad. Although the worst conditions of this sort exist to-day in this country in only a few of the larger cities, symptoms of them begin to appear in many smaller places. It must be remembered that scarcely fifty years ago there had not been a regular tenement-house built in New York City. Another fifty years may as radically change the conditions of scores of other cities, if their inhabitants and their officials are not wise in time. These conditions of life affect not only the health, but the minds and morals of the people who are obliged to accept them, and are a source of danger outside of the walls of such buildings as well as inside of them. Much has been accomplished already in New York, in Brooklyn, and in other cities in the way of controlling

* Read at meeting of American Public Health Association, Brooklyn, N. Y., October 22d, 1889.

the plans of new buildings and the alteration of old buildings, and this has, no doubt, contributed, among other causes, to reduce the average death-rates of such cities. But to find the most conspicuous illustration of what can be done in this direction to improve health and lengthen life we must cross the ocean and take a look at London. In that enormous and still rapidly growing metropolis sewerage arrangements have long been most difficult, and the water-supply would here be reckoned very scanty indeed. But time and money have been freely expended in investigating conditions and possibilities, and when it was found where money was needed to be spent it has been expended in heroic measure; and as one result, step by step, the death-rate has been reduced to figures which even twenty years ago would have been deemed impossible of attainment. To compare the 15.99 death-rate of London in 1888 with the 26.18 of New York, the 23.23 of Boston, the 22.72 of Brooklyn, or even the 20.72 of Philadelphia, is to suggest to all these cities that there is abundant room for them and for others to advance the conditions which assist to maintain health and lengthen life. And yet at no time has London caught up with its best possibilities, and much less have our American cities approached theirs. It was about the time when the first tenement-house was built in New York (1838) that in London a few people began to struggle with the problem of the better housing of the poor. Since then many individuals and societies have invested millions of pounds sterling in erecting buildings intended to furnish the best accommodations within the rent-paying power of the working-classes. Among these efforts, it seems to me, the first place unquestionably belongs, equally by its plans, its management, its magnitude, and its results, to the Improved Industrial Dwellings Company, of which Sir Sydney H. Waterlow is chairman. This company has now invested over £1,000,000, and has or soon will have accommodations for 5300 families in its London buildings. Their plans afford an abundance of direct light and air to every room in the buildings, and furnish all necessary sanitary conveniences separately to every tenant. Their buildings are, moreover, distinguished by the exterior staircase, usually sunk into the front of the building, though sometimes in the rear, and open to the air; so that there is no common

interior shaft, staircase or hall, and no interior communication whatever from floor to floor. Almost all of these dwellings are let to families with children, and the percentage of children to total population must be higher within these buildings than in the metropolis at large. Because of this and of the greater birth-rate we should expect a higher death-rate in these buildings than the average of London, but the official returns of the Registrar-General prove the contrary. I wrote Mr. James Moore, the secretary of the company, asking for some details regarding infant mortality and quote from his reply: "I have had the returns of births and deaths for last year abstracted, with the following results: Number of deaths under 1 year, 88, or 4 per 1000 population; number of deaths from 1 to 5 years, 49, or 2.2 per 1000 of population. This is for the year to June 30th last, during which our total death-rate was only 11.2 per 1000, the birth-rate being 35 per 1000." The buildings erected in London by the Peabody Trust Fund are built on models more closely like old-style houses, but with abundant light and air. Their tenants, about 20,000 in number, average somewhat less in weekly earnings than those of the Improved Industrial Dwellings Company. In the buildings erected by the trustees of this fund the average annual death-rate in six recent years is 0.96 per 1000 below that of all London. This would be considered a very large percentage in the saving of life were it not contrasted with the saving of 6.3 per 1000 in the buildings of the Improved Industrial Dwellings Company. I cannot but regard the greater saving in these latter as due to the superior plans of construction, and especially to the outside staircase system. Reckoned per 1000 of population of all ages, the death-rate of infants under 1 year shows a slight excess over the same ratio in all London in all these buildings, but reckoned per 1000 of infants living, it is decidedly lower than the outside average. The unusual proportion of young children in these improved dwellings is, of course, balanced by a lower adult proportion. Hence, while we find an infant death-rate nominally a trifle above the average London, we find a death-rate for those above 1 year old scarcely over one-half of the average of the whole metropolis. It is unfortunate that we cannot compare the deaths under 1 year, under 5 years and above 5 years with the number of

living of same ages. Such a comparison would, in my judgment, show that of the lives saved annually to the occupants of these improved dwellings half or more than half were saved under 5 years of age. Those interested to see buildings constructed as closely to these best London models as differences of climate, building materials, and tenants' wants allow, can find them here in Brooklyn, in the Tower Buildings, at the corner of Hicks and Baltic streets, where accommodations for 1000 to 1100 people have been in use since 1878, or can see similar buildings in course of erection at the foot of Joralemon Street. The tenants of the Hicks Street buildings are usually perfectly willing to show their apartments to visitors, if the hour be convenient. A record of deaths in these Brooklyn buildings has been kept by the agent, but it is quite possible that deaths occur without his being advised or hearing of them —and a population of 1060 is, moreover, too small to furnish reliable averages. It was my intention to make a close comparison of the ratio of children dying to children living in these blocks and in all the neighboring blocks of old style tenement-houses ; but it has been practically impossible to obtain figures of the population of these other houses, as there has been no census here since 1880, and those returns are seemingly inaccessible in Washington, and the health officers here felt themselves powerless to secure the information desired. In the city of Brooklyn at large the annual deaths of children under 5 appear to average between nine and ten in the hundred of those living within same ages, while in these buildings it is between six and seven, according to the agent's figures. In old-style tenements of about the same size in New York the Board of Health figures show a corresponding rate of 11.4. It appears from the death records in these Brooklyn buildings that there is no instance in which a contagious disease has been communicated to apartments adjoining or above or below. These diseases, of course, enter there as into the best-guarded private houses, but the outside staircase has so far provided all necessary isolation, while in ordinary houses used by several families the stairway hall is as natural a vehicle for the communication of disease as for that of sound, smells, or flames. Cholera infantum, that product of summer heat, may be lessened in these buildings, in so far as abundance of air,

as fresh as it is to be had in the city, is furnished by through ventilation from front to rear in every apartment. But fresh air is not to be had in the city after days of high temperature, and the effects of the hot weather on infants are even greater than the statistics of death show. For these ratios are made upon the basis of winter population, while in our largest cities thousands of little children whose parents are well to do spend every summer out of town. Here in Brooklyn the Children's Aid Society has provided for poor children a Sea-side Home at Coney Island, and near by it is a similar home of the New York society. In these homes children are kept a week or longer, and it is the belief of those in charge of the Brooklyn home that any cases of simple diarrhœa sent there can be cured in the sea air, even if life might not have been prolonged in the city more than a very few days. It would be interesting to follow these cases back to their homes in the city and see whether the primary good results were maintained permanently. In every direction there is need of more accurate statistics concerning present conditions and the results of experiments in remedies. It seems to me that in every large city an account should be kept with each street, each block, each house. Its population needs to be accurately known and it might be charged as in a ledger account with its deaths. Such figures may seem dry to thousands of people who ought to be interested, but they mark the distance advanced and point the forward road. Every city ought to take advantage of the coming United States Census to secure from the Government officials a copy of its census roll, house by house. The death-rate of all our cities ought to be reduced five in the thousand from present figures, and at no distant day. In a city the size of Brooklyn that would mean 4000 lives saved annually. Among the directions in which this saving will be made, those that pertain to the dwellings of the people and the care of little children seem to me likely to be among the most prominent.

FOOD—ITS RELATION TO HEALTH.*

By Miss JULIET CORSON.

To prepare food for perfectly nourishing and strengthening the body is a process within the compass of any intelligent woman ; for enough is known of its chemical composition, and its effect upon the system through the physiological process known as destructive assimilation, to establish definite lines upon which to build up a suitable and practical theory of dietetics—that is, the use of food in direct relation to our bodily needs.

Scientific investigators have demonstrated the fact that certain foods produce within the system definite and positive effects. For instance, it has been demonstrated beyond question that the use of stimulants can be regulated by consuming a fixed line of foods. I do not hesitate to assert that the wife of a drinking man can, in many cases, so plan his food as to largely control his desire for liquor, and with his consent and help she can destroy it, unless it has been so persistently indulged as to have fixed upon him the disease of dipsomania in an aggravated form ; or unless that disease has been inherited, in which case medical treatment is imperative. When the advocates of prohibition have requested me to refrain from using liquor in giving cooking lessons, they have asked of me impossibilities, considering my position as a teacher of cookery ; and I have replied to them that personally I favored temperance in all things, that its teaching was one of my lines of work, that they could accomplish more general reform from drunkenness by following that special line of my work than by the mere use of words, however eloquent ; I have said that when any responsible temperance organization will properly publish it I will prepare a temperance cookery-book, which shall be planned to serve as a guide to every-day cooking in homes where the use of liquor is avoided. Of course we can-

* Address at the Brooklyn Institute, Brooklyn, N. Y., November 11th, 1889, "On the Promotion of Health," in connection with the Health Exhibition.

not expect to make old-fashioned Christmas plum-pudding and mince-pies without using wine or brandy ; but there are innumerable and most savory dishes of all kinds into the composition of which no liquor enters.

Personally, I believe that there are certain kinds of food and medicine which, in chronic cases, give more beneficial ultimate results than alcohol ; but when artificial stimulus is called for in an emergency, I have been assured by many physicians that they have no agent which will so rapidly accomplish certain physiological action ; and when they use it they guard against the depression it causes. The habitual drinker does no such thing. When he feels badly, after the reaction sets in, he simply takes another drink of his original poison. I will venture to offer a suggestion to habitual tipplers against the next time when some stimulant shall be desired, if our total abstinence friends will absolve me from any blame of advocating the use of liquor. There is a French preparation of mint—our familiar herb peppermint—which is to be found in most wine-rooms and clubs, a small glass of which, mixed with shaved or powdered ice, is not only a most refreshing beverage, but a stimulant from the ordinary use of which no intoxication is felt, and from which no reaction, or, rather, no depression results. When one is weary, overtaxed, exhausted, this is an excellent restorative, like other preparations of peppermint.

To return to the subject proper, of food and its effect upon the body : The sense of taste is not only a minister to our pleasure—the capacity for appreciating the various flavors of food—but it is the first stage in the process of digestion ; the indication that we shall favorably receive the elements combined in the form of nutriment which is necessary to the maintenance of vigorous and enjoyable health.

It is not a sin to linger over our food, to enjoy it to the extreme ; the more pleasant it is, the more good we receive from it. Even the sense of sight, gratified by an attractive refreshment, spread upon a well-laid table, prepares us for receiving all possible benefit from it. No original operation of nature can justly be termed reprehensible ; and, therefore, the time employed in placing our food before us in the most appetizing manner is well spent ; there is as much reason for accepting every advantage from eating and drinking in health-

ful moderation as there is for admiring a cloudless sky or the awful beauty of a summer tempest.

In addressing you upon this relation of food to health, our greatest difficulty lies in the selection from among the many points worthy your earnest attention. It would require a course of lectures, rather than our one small friendly talk, to offer you even an outline of the subject. Perhaps I can best serve the purpose of your committee by submitting a brief general outline of dietetics, and then answering any questions you may address to me. We may preface our discussion by accepting the fact that to insure perfect digestion we must have all the digestive organs in good condition; from the mouth, where the saliva performs its first office, where mastication prepares all food to be acted upon by the intestinal juices, to the sound flesh of the body in the midst of which the healthy blood is constantly engaged in transmuting all the nutritive elements gathered from our food.

Returning for a moment to the action of the senses of sight and taste. We naturally close the eyes away from the sight of any unpleasant substance, like a nauseous dose of medicine, while we truly say that even the sight of some dishes makes the mouth water; in other words, so pleasantly does sight present the idea of the food to our consciousness that the salivary glands respond at once, and the moistening of the mouth which results, not only prepares us to discriminate between the flavors, by stimulating the sense of taste, but also begins that chemical transformation of elements which is the first step in the process of digestion. Some degrees of taste are absolutely an exercise of the sense of touch, such as the biting, acrid taste of an astringent like alum, or the smooth, bland taste of good olive oil.

Let us locate some of these perceptions of taste upon the tongue: the *tip* and *front* edges are specially sensible to the action of *sweet* and *sour* qualities in food, because they excite the papillæ or tiny projections of nervous flesh which cluster thickly there, and which communicate directly with the gustatory nerve running to the base of the brain.

Salt and *bitter* flavors affect the *back* and *base* of the tongue; and, because the nerves there located are so intimately connected with those of the throat and stomach, they communi-

cate instantaneously by contact ; and when the flavors are so pronounced as to be nauseating, muscular contraction is sufficiently marked to cause nausea, even to the extreme. These keen conditions of sense are impaired and eventually destroyed by the excessive use of alcohol and tobacco.

Even this detail will show somewhat the extent of discussion over which our subject would lead us had we time to follow it. But we must be content to indicate a few leading facts, and enlarge only upon those most applicable to daily life.

Nutrition, or the transmission of the nourishing properties of food to the human body, is influenced by age, climate, season, occupation—in or out-door, active or sedentary, mental or physical—exercise and exposure to weather, and the general condition of health ; by the daily supply and variety of food, its freshness and suitability, its digestibility or the reverse state ; for we are always proving the truth of the old adage that " What is one man's meat is another man's poison." The question as to whether we shall eat this or that food can only be answered by testing the effect it has upon our health and strength.

In estimating the average quantity of cooked food required to keep an adult man in good working condition some definite experiments have been made by careful men of science ; the *résumé* of some of their conclusions is as follows :

Professor J. C. Dalton calls for 38½ ounces of cooked solid food and 3¼ pints of fluid ; Dr. Brown-Sequard, from 36 to 42 ounces solid and 2 pints fluid ; Dr. Letheby, 38 ounces solid and 3 pints fluid daily. As all these authorities are unquestionable, we must conclude that the difference in their estimates is occasioned by the nutritive quality of the foods tested, the season at which the experiments were made, and the personal physical requirements of the experimenters ; we must average these examples, using them to indicate the lines upon which we may safely proceed to make our individual estimates.

General usage has ascribed a threefold character to the articles of food in ordinary demand ; they are termed nitrogenous or flesh foods, carbonaceous or heat foods, and phosphatic or brain and nerve foods.

Flesh food maintains the general vigor, and is required in

abundance by laborers, athletes, soldiers, and sailors, and all persons liable to be called upon to make short and disconnected exertions of strength in addition to ordinary demands upon them ; the nutriment they need abounds in fresh lean meat, salt pork, ham, and bacon, the red-blooded fish, oatmeal, unbolted flour, eggs, cheese, milk, cabbage, onions, asparagus, celery, salads, cauliflower, corn, spinach, peas, beans and lentils.

Heat food keeps the bodily temperature at a normal point, and affords that kind of nourishment necessary to slow, steady workers, and invalids suffering from wasting diseases ; it includes fine flour, honey, sugar, butter, the fats and oils, fat mutton and beef, pork and fat bacon, liver, oily fish, grapes and sweet fruits, rice, potatoes, beets, carrots, turnips and parsnips.

Brain and nerve foods are properly those which are very nutritious and digestible, which yield the most nourishment with the least tax of the digestive organs ; they constitute the diet required by intellectual workers, nervous invalids, and dyspeptics ; this class of foods includes delicate game, poultry, oysters, fruit, especially the sub-acid varieties, juicy vegetables, and certain artificial chemical compounds usually prescribed by physicians.

A bountiful table generally offers that variety of nourishment required by the different physical conditions and occupations which are likely to occur in every large family or public household. If the catering is conducted intelligently there will be meat, vegetables, bread, and a wholesome dessert ; part of the meat and vegetables should be served in the form of a soup or liquid stew ; this point is so closely connected with the nutritive process that housekeepers should attend closely to it. Poultry and fish should vary the ordinary fare when they can be obtained ; and fruit, either fresh or stewed, should be eaten frequently. The soup would supply both heat and flesh food ; fish would give flesh, brain, and nerve food ; meat would be chiefly flesh food, unless it were fat, when it would combine heat food ; white bread, pastry, and puddings, would be composed principally of heat food ; vegetables combine the various elements, besides furnishing the waste matter so indispensable to health ; but if vegetables

alone were eaten, in a quantity sufficient to sustain the strength, their bulk would be physically injurious. The fact must always be borne in mind that all kinds of food are valuable to just that degree in which they afford the elements demanded by certain conditions of the system.

It is true that appetite is largely governed by habit, and that we have to learn to eat even such ordinary foods as oysters and tomatoes; but it is also a fact that personal idiosyncrasies sometimes make such apparently benign aliments as milk and eggs nearly equivalent to poison. It will not, therefore, be superfluous for us to give some thought to certain marked peculiarities of ordinary esculents. It will be only these marked peculiarities that I shall specify now.

Oysters contain iodine to a perceptible extent, and sufficient pepsin to digest in their own fluid. Red-blooded fish, which also contains iodine, is a restorative in consumption, especially if it is of an oily nature, like mackerel and salmon; the oil of fish is believed to stimulate the entire system and quicken the circulation, thus causing thirst. During the spawning season the oil is largely replaced with water, and the hygienic value of the fish is correspondingly reduced. The oil of herring, shad, mackerel, eels, trout, and salmon is distributed throughout the entire flesh, and thus augments its alimentary value; but in most of the white-blooded varieties, such as cod, haddock, and flounder, it is confined principally to the liver; hence the usefulness of that organ in the preparation of the oil so much used for consumptive persons.

Beef is the meat usually chosen to supply concentrated animal food; the juice of rare beef free from fat, and properly-made beef tea, act as stimulants in cases of impaired nutrition, and also supply valuable salts to the system.

Milk and cream can be used advantageously in similar cases, where they do not tax the digestive powers. In hot weather small quantities of hot milk taken frequently are preferable to the use of iced drinks. In some cases of gastric derangement milk relieves pain and allays inflammation. Milk diet is successfully prescribed by celebrated physicians to meet certain forms of disease, and "milk and whey cures" have been known for ages; the Swiss "Cures" were resorted to by the Romans in the time of the Empire.

Among beverages tea, coffee, and chocolate are anti-spasmodics and nervous stimulants ; chocolate, both in the familiar paste and in cocoa shells and nibs, is nourishing as well as stimulating.

Coca, which is coming into use among chemists in the preparation of certain nourishing tonics, is the dried leaf of a plant quite different from the Theobroma tree, from the seeds of which cocoa is made ; it is more properly a medicine than a food.

Among the condiments salt is absolutely necessary to the preservation of health ; pepper, and the different spices and aromatics, are grateful aids to appetite and digestion, besides possessing the properties of abating flatulence, and preventing or dispelling nausea. I am now referring to their moderate use by adults. Olive oil is nutritious and laxative.

White sugar is an excellent demulcent, and has the effect of softening some of the harsher properties of the acid fruits ; it also quenches thirst when used with water as a drink. Molasses and raw sugars are laxatives, and the poorer grades should be cautiously used on that account.

Sea-weeds and mosses are nutritious tonics and good demulcents, useful in soothing any irritation of the alimentary tract.

Entire cereals, such as cracked wheat and oatmeal, are very nutritious, and contain a good quantity of the valuable mineral salts of lime, soda, silica, magnesia, potash, and phosphorus ; the whole cereals are gently laxative.

Sago, tapioca, arrowroot, farina, corn-starch, rice, and barley are bland, demulcent nutrients.

Breads made from rye, corn, or graham flour are nutritious and laxative ; those made from fine white flour and gluten flour are constipating, as are all concentrated foods.

Vegetables generally are laxative. Cabbage, garlic, onions, Jerusalem artichokes, horse-radish, spinach, lettuce, water-cress, asparagus, and celery are diuretics, and consequently useful in rheumatism ; the last, celery, is a strong nervous stimulant. All vegetables contain potash, lime, iron, and other valuable mineral salts.

Fresh fruits, such as apples, pears, peaches, grapes, lemons, and oranges, are excellent laxatives ; dried figs, prunes, and tamarinds possess similar qualities. Lemons, limes, oranges,

and tamarinds are well-known remedial agents in rheumatism, scurvy, and jaundice. Cranberries, which contain an excess of citric acid, have marked antiseptic properties. Grapes, which in Europe have assumed an important curative position, contain glucose, chalk, soda, manganese, oxide of iron, potassium salts, and phosphoric, sulphuric, and tartaric acids; their organic acids are changed to carbonic acid in the blood; they are excellent in dyspepsia and in fevers. In the absence of grapes some of their valuable elements may be obtained from pure wine and from raisins, which are also very nutritious.

If any attempt is made to apply these specified properties of different foods to certain physical conditions, the fact must be borne in mind that the condition of the foods is greatly affected by the season in which they are used, the manner in which they are stored, and the methods employed in preserving them. It must be remembered that juicy fruits are best at the point of ripening.

Succulent vegetables, such as spinach, cress, small salad plants, and garden herbs, are prime just before flowering.

Roots and tubers are best at their maturity, and deteriorate by long exposure to a dry atmosphere.

Meats and poultry are best in winter, when they are generally full grown, and the temperature permits their keeping until the tenseness of fibre immediately succeeding killing has passed away.

NESTLE'S MILK FOOD.—Among the thousands of exhibitors who have made a display of their wares at the Paris Exposition this year, less than one half received any award; the remainder received honorable mention, bronze, silver and gold medals; but to a very limited number was the Grand Prize awarded.

Those most competent to appreciate the excellence of prepared food for infants, however, will not be surprised to learn that the Grand Prize was awarded to Nestle's Milk Food. This is the second occasion on which this great distinction has been conferred on this celebrated infants' food.

SANITARY ENTOMBMENT: THE IDEAL DISPOSITION OF THE DEAD.*

By Rev. CHARLES R. TREAT, of New York.

IT is a strange thing that the time should have come to attack the churchyard in its use for the burial of the dead; but it is really far more strange that the churchyard should have come to be one of man's most deadly foes. This every thoughtful man will now have to admit to be true, and this will make easy what otherwise would have been impossible for a tender or reverent mind.

As a general statement, it will suffice to quote the words with which Lord Beaconsfield denounced the churchyard, in the House of Lords, in 1880: "What is called 'God's Acre' is not adapted to the times in which we live or to the spirit of the age. The graveyard is an institution prejudicial to the public health; and the health of the people ought to be one of the considerations of a statesman. The time has arrived when a safer disposition of the dead should be instituted."

In view of such a statement, and of many more that come readily to mind that have been made in stronger terms, and most of all in view of the fact that the agitation against the churchyard has been maintained for more than a hundred years, it is amazing that this use should die so hard; and, as we survey the past, it will amaze us more, to be compelled to confess, that the churchyard has been made man's foe by civilized and Christian men! The story of this use of consecrated ground is so short that, although familiar, it may well be told again.

In the early Christian centuries, as in the centuries preceding, among men of all religious beliefs and practices, the conviction, both instinctive and founded on experience, prevailed, that the dead should not be brought into proximity with the living. Accordingly the practice definitely demanded by the "Twelve Tables" became universal, not to bury within a

* Address elaborately illustrated by stereopticon, before the American Public Health Association, at Brooklyn, N. Y., October 23d, 1889.

"city" or any group of human habitations. The first step in the wrong direction seems to have been taken at the dying request of the first Christian emperor, who was interred at the entrance of the Church of the Holy Apostles, in Constantinople. The tendency, however, to follow this example, and to secure similar interment in holy earth, was stubbornly resisted ; and it was not until the latter part of the sixth century that burials were permitted within towns or cities, and it was not until the eleventh century that burials were permitted in churches. From this time the custom continued without notable interference, until the latter part of the last century. Then, in that era of tremendous change, the churchyard did not escape. In Paris, the churchyard of the Church of the Holy Innocents was first condemned in the interest of the public health, because much sickness had been traced to the foul stenches that rose therefrom ; and it is worthy of special notice, as indicating the extent of the danger, that M. Thouret, the official charged with the duty of disinterring the dead, was overcome by the foul air that he was compelled to breathe, and barely escaped with his life from a putrid fever that he there contracted. A little later the grounds about the churches of St. Germain des Pres and St. Eustache were also barred from burial, and the contents of their graves were carried to the quarries that have since become the "Catacombs" of Paris. In Austria, under Joseph II., the ruler of such unhappy methods but of such noble aims and advanced ideas, the burial of the dead within or near to churches was prohibited by law, and this was such an honest enactment that neither rank nor wealth could evade it.

In England, unhappily, the progress of this reform was not so rapid. Bishop Latimer had soundly said, in a discourse upon the restoration to life of the widow's son at Nain : "The citizens of Nain hadd their buryinge-place withoute the citie, which no doubt is a laudable thinge. And I do marvel that London, being soe great a citie, hath not a burial-place withoute. For no doubte it is an unwholesome thinge to bury within the citie, especiallie at such time when there be great sicknesses and many die together. I think verilie that many taketh his death in St. Paul's churchyard. And this I speak of experience, for I myself, when I have been there some

mornings, to heare the sermons, have felt such an unwholesome and ill-favoured savour, that I was the worse for it a while after, and I think no lesse but it is the occasion of great sicknesses and disease." And it is deserving of mention that Sir Christopher Wren entreated the citizens of London, in rebuilding the city after the great fire of 1666, to put an end to the pernicious practice of burying within their churches and about them, and even within the limits of their city. But these appeals, and many more that were more urgent and more recent, were vain, and it was not until nearly the middle of our proud century that England would listen to the reformer of this crying evil.

In this country, partly because there were few places of large population, and partly because it was an early and general tendency to use cemeteries rather than churches and the grounds adjacent to them, the evils of earth-burial did not manifest themselves so soon or in so marked a manner as in the old world. But there were instances enough to convince the most incredulous that a radical change must be made. Dr. Ackerly, writing in 1822, thus describes the condition of the burial-ground connected with Trinity Church, New York, forty years before: "During the Revolutionary War this ground emitted pestilential vapors, the recollection of which is not obliterated from the memory of a number of living witnesses." In the same year the *Commercial Advertiser* published an article in reference to the present evils of earth-burial at the same place, in which it was said: "It will be remembered that the graveyard, being above the streets on the west and encompassed by a massive stone wall, and the east side being on a level with Broadway, it results that this body of earth, the surface of which has no declivity to carry off the rain, thus becomes a great reservoir of contaminating fluids suspended above the adjacent streets. In proof of this, it is stated that, in a house in Thames Street, springs of water pouring in from that ground occasioned the removal of the tenants on account of their exceeding fetidness." At a later date Dr. Elisha Harris brought this telling indictment against the same place of interment: "Trinity churchyard has been the centre of a very fatal prevalence of cholera, whenever the disease has occurred as an endemic near or within a quarter of

a mile of it. Trinity Place west of it, Rector Street on its border, the streets west of Rector, and the occupants of the neighboring offices and commercial houses have suffered severely at each visitation of the pest, from 1832 to 1854." It seems hardly necessary to add that the foregoing statements are not intended to make the impression that there was a worse condition at the churchyard named than at any other. The truth is, that this only illustrates what was universal throughout the city; and, in proof, it may be cited, among the unsavory recollections of the time, that the sexton of the "Brick Church," Beekman Street, was accustomed to caution the persons standing near, when a body was to be deposited in the vaults, saying: "Stand on one side. You are not accustomed to such smells!" And the sexton of the Dutch Church close by was known to have said that, when going down into the vaults, the candles lost their lustre, and that the air was "so sour and pungent that it stung his nose." Naturally, therefore, it was noted in the public press: "This being the case with all the vaults, where dead bodies are deposited and subject to be opened at all seasons, this method of disposing of the remains of our friends is at the least an unpleasant and certainly a dangerous one." And the result was to be expected, that the Board of Health should utter their official protest against the continuance of the perilous practice, as they did in 1806: "Interment of dead bodies within the city ought to be prohibited. A vast mass of decaying animal matter, produced by the superstition of interring dead bodies near the churches, and which has been accumulating for a long time, is now deposited in many of the most populous parts of the city. It is impossible that such a quantity of animal remains, even if placed at the greatest depth of interment commonly practised, should continue to be inoffensive or safe!"

It may now be said: "Yes, this is all true, but we have changed all that! We no longer inter our dead in churchyards or burial-grounds within the limits of cities. We have provided cemeteries at great distances from our cities and large centres of population, and there the dead can do no harm."

To this the reply is easy and convincing; that, if the dead

endanger the living when the population is dense, they certainly also endanger them when the population is sparse. The danger is only diluted. It still exists, and it ought to alarm us just as truly when a few are imperilled as when many are. As lovers of our kind, as claiming to be humane, we can no more be indifferent to the danger of a few than to the danger of many. True philanthropy has no sliding scale by which to gauge her gifts. And if the evils of earth-burial issue from the fact that a lifeless body is buried in the earth, then these are not escaped and cannot be, unless the dead are buried at such a distance from the living that the living can never come into contact with the earth in which they lie, or breathe the air or drink the water which they pollute. Therefore, the question, as to the effect upon human health of our cemeteries, can be considered settled in the case of all that are not remote from the habitations or the approach of men ; and such cemeteries, as we know, are few, and they are not the cemeteries which lie upon the borders of our great cities.

To strengthen this general position it will be sufficient to quote the familiar but weighty assertion of Sir Henry Thompson : " No dead body is ever placed in the soil without polluting the earth, the air, and the water above it and about it ;" and the testimony of Dr. Holland, who speaks as the opponent of this reform and the antagonist of Sir Henry Thompson, that the best situated cemeteries may be so mismanaged as to become unsafe ; that cemeteries should not be too near dwellings ; that they should not be overcrowded ; that the soakage from them should be carefully guarded against ; and that wells near burial-grounds are unfit sources of drinking water ; and the declaration of the French Academy of Medicine, that the cemeteries of Père-la-Chaise, Montmartre, and Montparnasse, once suburban now intramural, are the cause of serious disorders of the head and throat and lungs, that result in the loss of many lives ; and to note the experience of Brooklyn, half-girdled with graves, of which the editor of THE SANITARIAN does not hesitate to assert : " Typhoid-fever is, taking one year with another, increasingly prevalent in Brooklyn, and it is, in our judgment, probably due for the most part to sewage-pollution of the intensest and most loathsome kind—the seepage of graveyards !"

Thus far this subject has been treated as though the only evil influence that a decomposing body could exert would be through the poisonous character of the resultant compounds. Unhappily, the story is only partly told, and greater dangers remain to be revealed.

Within a few years it has become unquestioned that some of the deadliest diseases that attack mankind owe their origin and propagation to living organisms, and it may yet appear that the field of their operation is far wider than we now think. Not to attempt to tell all that has been ascertained, it will be sufficiently convincing to quote from Sir Henry Thompson's utterance in the *Nineteenth Century*, in 1880: "I state, as a fact of the highest importance, that, by burial in earth, we effectively provide—whatever sanitary precautions are taken by ventilation and drainage, whatever disinfection is applied after contagion has occurred—that the pestilential germs, which have destroyed the body in question, are thus so treasured and protected as to propagate and multiply, ready to reappear and work like ruin hereafter for others. . . . Beside anthrax, or splenic-fever, spores from which are notoriously brought to the surface from buried animals below and become fatal to the herds feeding there, it is now almost certain that malarious diseases, notably Roman-fever and even tetanus, are due to bacteria which flourish in the soil itself. The poisons of scarlet-fever, enteric-fever (typhoid), small-pox, diphtheria, and malignant cholera are undoubtedly transmissible through earth from the buried body." That the burial of a body which contains the seeds of zymotic disease, is simply storing them for future reproduction and destruction, is amply proven by the researches of Darwin and Pasteur; of whom the former has shown that the mould, or fertile upper layer of superficial soil, has largely acquired its character by its passage through the digestive tract of earth-worms, and the latter, that this mould, when brought by this agency to the surface from subjacent soil that has been used as a grave, contains the specific germ of the disease that has destroyed its tenant.

We may fitly close this portion of the discussion with the conclusion, so strongly stated by Dr. James M. Kellar, in his report to the session of the American Public Health Association, at St. Louis, in 1884, which is far from an overstate-

ment of the truth : "We believe that the horrid practice of earth-burial does more to propagate the germs of disease and death, and to spread desolation and pestilence over the human race, than all man's ingenuity and ignorance in every other custom."

It may now be asked : "Granting that these evils are inseparable from the burial of the dead in the earth or in tombs, what is the remedy ? What else can be done ?"

To this question not many answers can be given, because the modes of disposing of the dead have always been and must always be few.

Plainly, no such novel mode as casting the dead into the sea will be generally adopted. Plainly, also, the mode of the Parsees, grounded as it is in ancient, if not original, use—to give the dead to beasts and birds—will not become universal. And, plainly also, cremation will not be welcome to the many, free as it is from objection on the score of public health, if a method equally sanitary, and at the same time satisfactory to a reverent and tender sentiment, can be devised.

The inquiry, then, has reached its limit. For, apart from the modes that have just been named, there are no others but earth-burial and entombment ; and earth-burial, as we have seen, cannot be made sanitary under common conditions. Therefore, if the demands of affection and sanitation are both to be met, entombment is to do it, or it cannot be done.

Happily, better than any other method of disposing of the dead that has ever been devised, entombment has met the demand of affection. Never has any other mode so commended itself to men as this. There may have been at times a general adoption of cremation, and there may have been a general prevalence of earth-burial, but the one has not long satisfied the sorrowing survivors, and the other has owed its beginning and continuance to the apparent absence of alternative. Wherever the living have been able, and the dead have been dearly loved or highly esteemed, the tendency to entomb and not to bury has been constantly manifested.

To call attention to this tendency is enough to prove it, so easily accessible is the evidence and so familiar is its operation in the human heart. The most natural reference will be, first, to the mausoleum, the tomb of Mausolus, that was erected

by his sorrowing Queen, Artemisia, at Halicarnassus, upon the Ægean's eastern shore; and that became at once one of the few great wonders of the ancient world. This was intended to do honor to the loved and illustrious dead; and this it did, as no grave or pyre could do. This was also intended to protect the lifeless form from ruthless robbery and reckless profanation; and it performed this task so well that, for near two thousand years no human eye beheld the mortal part of Mausolus and no human hand disturbed its rest. At a far earlier time, Abraham, the Father of the Faithful, while he illustrated this tendency to entomb the dead, also offered an influential example to all who would do him reverence, as, in the hour of his great sorrow, he sought the seclusion and the security of Machpelah's cave for the last earthly resting-place of his beloved wife. There he buried Sarah; there he and his son and his son's son and their wives were all laid to rest, and the place of their repose hath not been violated even at this distant day. To this constant tendency constant testimony is borne by the massive and magnificent tombs in which India abounds, the tombs and pyramids that make marvellous the land of the Nile, the tombs that stood thick upon the Appian Way and that rose superb upon the Tiber's shore, the modern use to which the Pantheon is put, the Pantheon at Paris and the Crypt of the Invalides, the Abbey of Westminster matchless in memorials, the sepulchres within the hills that gird Jerusalem, and the sepulchre in which the Nazarene was gently laid when His agony was ended.

It remains to consider whether entombment can be made sanitary; if it can be the problem is solved, for entombment has ever been the best that the living could do for their dead, and, with the added advantage of promoting, or ceasing to be prejudicial to, the public health, entombment will be the choice of all whom cost or caprice does not deter.

That entombment can be made sanitary is evident from the fact that, in countless instances, in many lands and through long periods of time, it has been made sanitary by the ingenuity of man or by unassisted nature; and it is also evident from the fact that decomposition and disease germs are the dangers to be guarded against, and that against these both ancient and modern science have been able to guard. Not to

enumerate all the modes that have been chanced upon or that have been devised by men, there are two that have been notable and are available for modern use—embalming and desiccation.

It is a delusion to imagine that embalming is a lost art; that, like some other marvels of the ancient time, this is a secret process that perished with the people that employed it. Did we desire it, we could embalm our princes and our priests, and retain their shrunken similitudes for distant coming times to gaze and gape upon, as skilfully as they who practised this art in Egypt's palmiest days. Nay, it is doubtless far within the truth to claim that, better than they did we could do; and we are actually apprised of better methods and results than they employed or could attain, and it is not unlikely that we shall hear of better methods still. But Egypt's method, or its modern counterpart, will hardly now be popular. It involves too much mutilation and too much transformation. When it has done its work little is left but bone and muscular tissue, and these are so transfused with foreign substances, that a form moulded from plastic matter or sculptured from stone could almost as truly be considered that of the lamented dead as this. Moreover, indefinite preservation of the dead is not desirable, and is not desired. The uses to which the Egyptian Pharaohs and their humbler subjects have been put in these days of indelicacy and unscrupulousness in the pursuit of science or sordid gain, are not such as to make many eager to be preserved for a similar disposition, when the present shall have become a similarly distant past.

Desiccation, in striking contrast with embalming, is the process of nature rather than of art; and involves no mutilation and no substitution of foreign substances for human flesh; and does not by unnatural means preserve the semblance of the human form so long that a susceptible sentiment is shocked and a due return of material humanity to the elements that gave it birth prevented. Desiccation is so far a natural process, that it seems not to have been thought of, until nature had done the work and shown the product; and through many centuries, and upon an extensive scale, nature had employed the process before it occurred to man to copy her, and adopt her method for the disposition of his dead.

Wherever the air that enwrapped the lifeless form of man or beast was dry, desiccation anticipated and prevented decomposition. In deserts, upon elevated plains, upon the slopes of lofty mountain ranges, to which the winds that passed their summits bore no moisture, the dead have not decayed, but have dried undecomposed. In the morgue attached to the Hospice of St. Bernard, the dead, lifted too late from their shroud of snow and borne thither to await the recognition of the friends, dry and do not decay. In the "Catacombs" of the monastery of the Capuchins at Palermo, and in the "Bleikeller" at Bremen, the same phenomenon has appeared. Even Egypt is a confirmation of these statements, for it is probable that, had much less care been taken to preserve the dead, they would not there have yielded to decay as in other lands; and that moisture is so far absent from the atmosphere that the dead would have been preserved from decay by desiccation had not embalming been resorted to. Upon the elevated western plains of this continent, the bodies of beasts and men, by thousands, have been preserved from decomposition by desiccation. To take one instance out of many that might be cited: A cave was not long ago discovered high up among the Sierra Madre Mountains within which were found, where they had rested undisturbed for many years, the lifeless figures of a little aboriginal household, dried and undecayed. Father, mother, son and daughter, one by one, as death had overtaken them, had been brought thither, bound so as to keep in death the attitude that had marked them when at their rest in life, and there they bore their silent but impressive witness to the beneficent action of the unmoist air that had stayed decay and kept them innocuous to the living that survived them. In Peru instances of this simple, wholesome process abound on almost every side; upon the elevated plains and heights, as also beside the sea, the dead of Inca lineage, with the lowliest of their subjects, are found in uncounted numbers, testifying that in their death they did not injure the living, because desiccation saved them from decomposition; and a recent traveller has vividly described the scene that a battle-field of the late war presents, and that illustrates the same process, where, though years have passed since the last harsh sound of strife was heard, the fierce and bitter combatants still seem

eager to rush to conflict or to sink reluctant into the embrace of death. And all these instances furnish conclusive proof that decomposition can be controlled, and that its loathesome and unwholesome transformations can be prevented, if only the simple conditions are secured that have already so extensively effected this result. That these conditions can be secured no one can doubt ; for, every day, in almost every clime, by processes familiar and available to man, the atmosphere has moisture added to it or taken from it ; and the extraction of the moisture from a portion of the atmosphere is all that is required to introduce the process of Peruvian desiccation into the sepulchres of Chicago or New York.

It will naturally be further asked, " Is this all that has been done to demonstrate the efficiency and availability of desiccation for the dead ?" To this the answer would be sufficient that the evidence that has been adduced is ample ; and that, at once, in perfect confidence as to the result, mausoleums might be erected, with provision for the withdrawal of the moisture from the atmosphere and for the passage of the desiccated air through the sepulchres in which the dead should rest. So little is involved, and so much has been accomplished without the application of any human skill, that it seems inevitable that, as soon as the resources of modern architecture and sanitary science are drawn upon, the desired result will be at once attained. But, to make assurance doubly sure, several carefully-conducted experiments have been made, under the supervision of the directors of the New Mausoleum movement, that prove that the conditions of desiccation can be controlled, and that decomposition can be prevented, that where it has begun it can be stayed, and that prolonged preservation, with a fair approximation to the appearance in life, can be made sure, for the recognition of absent friends, for transportation, or the furtherance of the ends of justice.

When, now, it is added, that desiccation has been ascertained to be an efficient agent in the destruction of disease germs, as proved by the experiments of Dr. Sternberg, of the Hoagland Laboratory, and by the investigations of other experts, enough seems to have been said to establish the truth of the assertion, that entombment can be made sanitary, and that, therefore, entombment offers the satisfactory solution of the problem

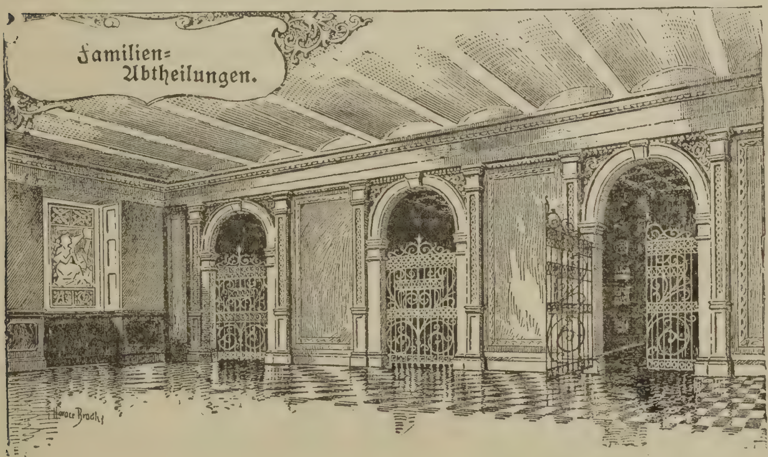
how to dispose of the dead so as to do no violence to a reverent and tender sentiment, and at the same time not to imperil the public health.

The proposition, then, soon to be submitted for public approval is this : to erect in the suburbs of our large towns and cities, perhaps even in their most thickly-populated parts, extensive and handsome edifices that will provide sanitary sepulchres for the dead. To be comparatively inexpensive, they will have to be comparatively plain ; and it seems not too much to hope that our cities will soon adopt this mode of disposing of the dead that depend upon the public care for burial, and that the horrors of a "Potter's Field," of which it cannot be divested even in a fair and sea-girt isle, may be forevermore unknown of men.

All these structures, however, will not need to be inexpensive and plain. Many of them, as the rich shall lavish their wealth upon them, will be spacious and splendid, as no tombs of earlier time have ever been. These will naturally differ in design and plan, and while one will incline to one order of architecture another will incline to another ; one will incline to the light and graceful style of the Greeks, another to the substantial and enduring Roman type, another to the still more firmly-built and time-defying type of the Egyptians, another to the rich and exquisitely decorative Byzantine style, and another to the Gothic type, with its suggestions of spiritual aspiration and heaven-sent consolation and heaven-born peace. It should certainly be the architect's study to avoid, as either of these styles is adopted, the appearance of edifices with familiar and established secular or sacred uses. These must, if possible, be so designed as to speak of repose and loving

care and undying recollection, and should appear to be homes for the dead, and yet temporary habitations in which they only rest until the resurrection.

Perhaps the most favored style will be that of the "Campo Santo," like that at Pisa, where the Holy Field lies light upon the dead, and where the softened sunshine and the tempered wind and the hushed notes of happy birds and the sweet seclusion of the spacious and graceful Gothic cloister, with its memorials of many who have been loved and lamented, and its rare pictorial teaching of the life to come, all speak soothingly of hope and peace and comfort. Such a "Campo Santo," modified to meet the demands of modern life and art, might well be one of the crowning monuments even of this wondrously achieving age. To what a grand and noble consummation would it seem to lead the race in their efforts for a fitting disposition of their dead! And what honor would it reflect upon the men who should erect it and place it at the command of their fellows, in due regard for what both health and heart require.



Within there would be, as the unit of construction, each sepulchre so constructed that anhydrous air could enter, or would be made to enter and withdraw, laden with moisture and morbific matter, which it would convey to a separate structure, where a furnace would complete the sanitary work that

the anhydrous air had begun, and return to the external atmosphere nothing that would be noxious. Each sepulchre, in itself and its surroundings, would appear to provide a place of repose, and would have electrical appliances attached to it for the instant indication of the return of consciousness to any who had been prematurely entombed; and would promise and provide the most perfect and permanent protection against intrusion or theft that can be found on earth. In arrangement these sepulchres would have to conform to the price paid and the taste of the purchaser. Many would be like the single graves that thickly ridge portions of our cemeteries; many more would be grouped together after the semblance of a family-tomb, as in the illustration; but in the general impression, in the surroundings and suggestions, the resemblance to the provisions of a cemetery would go no farther. For here, there could be no burning sun, no chilling cold, no inclement storm; for the living, as they should pay the last sad honor to the dead, or in any subsequent tribute of affection, there could be no exposure, and for the dead, there would be only the constant semblance of the comfort and the quiet of the best-ordered and most tranquil home. Thus, in providing the utmost that exacting affection and sanitary science can require, and in taxing to the utmost the resources of art, in architecture, in sculpture, and in the use of subdued and according hues and forms for appropriate decoration, these "Campo Santos," or "Mausoleums," or "Mansions of the Dead," will seem to have realized the ideal disposition of the mortal remains of those who depart this life.

SAM JONES ON THE FAITH CURE.—"I'll tell you where this faith cure comes in. There's an old brother and sister, who have been taking all the nasty, quack, patent medicines on the market for the last ten years. Somebody comes along and prays over 'em, and they quit using the patent medicines, and they are well again. They say it was faith that cured. It was faith. It was the faith which caused them to quit taking old patent nostrums, which cured them."

THE PHYSIOLOGICAL CONDITIONS AND SANITARY REQUIREMENTS OF SCHOOL-LIFE AND SCHOOL-HOUSES.

By A. N. Bell, A.M., M.D., Brooklyn, N. Y.

(*Continued from page* 435, *and Concluded.*)

SCHOOL-HOUSES.

The first question with regard to the sanitary condition of a school-house is its *site*. And it may be remarked at the very outset of the consideration of this branch of our subject, that it is within a very recent period only that the site of a school-house has been deemed worthy of any special attention. But the writer will leave the description of the past condition, to "go without saying," and take it for granted that any one who is enough interested in the subject of school hygiene to read what is here written, will have already become sufficiently familiar with the dangers of the past to justify the omission.

"Aspect and shelter," remarks J. Bailey Denton,* "have each their bearing upon salubrity and equality of temperature, but neither the one nor the other has an influence so great as the condition of the soil beneath and surrounding the dwelling."

All that may or can be said of site, with reference to the dwelling, may be said with regard to the school-house. Soils of the *country* commonly consist of the disintegrated materials of the hard crust of the earth mixed with decayed vegetable matter. Sometimes, along water courses, they are modified and, in part, produced by running water, floods, and tides, when they are known as *alluvial soils*, and at other times, when the condition is recognized as the result of glacier action, they are known as *drift soils*. But, to a far greater degree, soils are produced in the way first mentioned—by the gradual weathering of the rocks under atmospheric influence. But *city* soils not unfrequently consist of all sorts of rubbish, animal

* "Sanitary Engineering," by J. Bailey Denton, p. 48.

and vegetable, and, when the *sub-soil* is of a compact nature, saturated with filthy moisture.

The sub-soil is the underlying natural formation. This may, or may not, be of the same nature as the surface soil, and in the city, especially, it generally is not ; and, therefore, city sites for school-houses commonly require more careful attention than those in the country.

It must not be supposed, however, that artificially-made sites alone are to be looked upon with suspicion. Very few soils, natural or artificial, are to be found anywhere which do not require some treatment to render them healthful building sites for school-houses. All soils, in the absence of either natural or artificial drainage, hold water according to their interstitial spaces.

Soils differ materially, and with relation to building sites may be divided, first, into those which are comparatively impervious, and will therefore resist absorption—such as exposed rocks. And, secondly, into those that are pervious and retentive, absorb and give off moisture slowly—clays, marls, and alluvial soils of various degrees of density ; such are always more or less cold and damp, though owing to their peculiar density, they are sometimes protective against seepage from drains and cesspools, and, moreover, owing to the alumina they contain, they possess deodorizing properties. Hence their properties are in some respects beneficial, though they are insidious, and require cautious treatment. In elevated situations, they are, of course, less objectionable ; and so, indeed, of all building sites, because they can be drained with more facility. If built upon without drainage and damp-proof courses, it follows that the interior of the building will be liable to emanations rising from the ground beneath. Such emanations will in summer, when putrefaction is the most active, rise by their own buoyancy ; and in winter, the accumulated gases of decay, particularly carbonic acid, will be drawn out of the ground by the interior warmth of the building, and frequently, when the surface of the ground is frozen and impervious, from a considerable distance around, as the only place of exit for the pent-up gases. And besides these dangers common to soils everywhere, may be added, in thickly populated districts, the seepage of privy vaults, cesspools, and

broken sewerage pipes, the percolations from which sometimes follow in the line of walls and crevices to considerable distances. The "ground air" is liable to be impregnated with emanations from all decomposing material, and instances are by no means lacking to show that schools exposed to such dangers have frequently incurred severe epidemics of whooping-cough, measles, scarlet-fever, diphtheria, and typhoid-fever, and are constantly liable to pneumonia, catarrhal and diarrhœal diseases.

In all soils the dryness of the surface depends to a considerable degree upon elevation of site in relation with the level of the ground-water round about; and this varies at different seasons, according to rainfall and adjacent watershed, proximity of rivers, the facility of natural drainage, the existence and degree of inclination of any adjacent impervious sub-soils; and, as already mentioned, the nature of the soil in regard to porosity.

It is manifest, therefore, that the various conditions of site involve a wide range of careful consideration. If it be liable to dampness at any season of the year, it should be drained; and, above all, if it is so situated as to receive the land drainage from a higher level.

The drains for this purpose should be open-jointed tile, chosen and laid with special reference to soil water and *nothing else;* and their outfall should be into some open water-course exposed to the air. They should under no circumstances whatever be used as receptacles for house or cesspool drainage. The drains for these purposes, on the contrary, should always be impervious and provided with calked joints, traps, and ventilation.

Important, however, as soil drainage is to site, this alone will not protect school-houses from soil dampness and ground air—above all, those with cellars.

To entirely prevent emanations from the soil rising into the building, impervious damp-proof covering is necessary. Concrete is, perhaps, the most available substance for cellar or basement floors and foundation, inasmuch as the materials for making it of sufficiently good quality are everywhere easily obtainable. It should be laid at least six inches thick, thoroughly rammed, and grouted with liquid cement, or hot coal-

tar and asphalt. The side walls of the basement, at least, should be double, with an air space of three to four inches between, and there should be an excavated area of from three to four feet wide, protected at the bottom from the foundation to a level with the basement floor and on the outside by a damp-proof covering, with a view to light and dryness of the basement.

In the country, where abundance of land is available, school-houses should be built without basements—on pillars, so as to admit the free circulation of the air underneath ; but with double floors and intervening air space for protection against cold.

The aspect of school-houses with regard to sunlight and prevailing winds should also always enter into the calculation of site, as well as other conditions.

Of *building materials*, which necessarily depend upon availability, it is not deemed necessary to discuss, further than to remark that all alike require protective measures against interior dampness. It is a grave mistake to take it for granted that dampness rises from the base of the walls only, and that, therefore, protection against it from that source is sufficient. It requires but little observation to know that a driving rain and the soakage therefrom against the side and at the foot of the walls of a building, no matter what the materials of construction, frequently strike through, and the subsequent drying out of such moisture—depending upon the porosity and retentive power of the material—often requires many days and sometimes weeks.

It is interesting in this connection to state that by an examination made with reference to the choice of building stone for the British House of Parliament in 1839, it was found that the absorption of water for 100 volumes of rock was in the following proportions :

For three specimens of siliceous limestones, 5.3, 8.5, and 10.9. Three of nearly pure limestones from oolite, 18.0, 20.6, and 31.0. Six magnesian limestones, 10.7, 11.2, 14.3, 15.6, 17.4, and 22.1. In all the experiments the air was removed by first placing the specimens in water under the vacuum of an air pump. Brick, under the same process, will absorb from 10 to 30 volumes of water. Another danger in this connec-

tion is new inside walls. The too early occupation of school-houses, as of dwellings, with new plaster-walls, is well known to all observers to be a frequent cause of fatal illness.

For *damp-proof* courses in building, various materials are used, such as layers of sheet lead, slate bedded in mortar, asphalt, bituminous felts, etc. But for the best buildings in recent years, perforated glazed stoneware and earthenware slabs are preferred, and are believed to be superior to all other material. Apart from the primary object of preventing moisture, they afford air-passage, which is especially useful under the flooring in providing ventilation; while at the joints the perforations serve to break the vertical continuity of the mortar which might otherwise leave means for the rising of moisture. Such slabs are made of all thicknesses suitable to the sizes of building blocks or bricks, and are in every way admirably adapted to the purpose.

In situations particularly exposed to rain storms, brick and coarse sandstones are specially liable to saturation through their whole thickness. The only effectual means of preventing inside dampness from this cause is double walls; or, at least, wide interspaces between the outer walls and the lathing. Brick is so liable to complete saturation under such circumstances that it requires thorugh painting or other impervious coating.

Of the protection of wooden buildings against dampness little need be said in addition. Good timber, wide interspaces between the clapboarding and inner walls and the free use of paint accomplish the purpose.

In *arrangement* and *space*, architectural effect should not be wholly ignored, but it should always be held in subordination to health and safety. The grounds should be sufficiently ample, if possible, for aeration, as distant as practicable from all noisy occupations, and obstructions to light. Wherever adequate grounds are obtainable, the elevation should be of but two stories, and play-grounds outside. Basements for exercise and play-room, when necessary, should be especially provided with an abundance of light and air.

All school-houses should be, to whatever degree practicable, *fire-proof*. At the least, all staircases, air-shafts, passageways, and doors should be planned and constructed with special reference to safety in case of fire.

Wardrobes should be commodious, situated with special reference to good light and ventilation and facility of access.

Class-rooms should not be less than 20 x 30 x 16 feet: 192 cubic feet of air space each for 50 pupils. The area of window space in such rooms should be from 100 to 150 square feet, depending upon the direction of the light. The lintels should be near the ceiling, and the sills not less than three feet above the floor; and whenever light is available in sufficient quantity from the right direction, the windows should be wholly confined to the direction from the *left* side of the pupils at their desks. When more is required, preferably, the additional quantity should be from the other side of the room, or from the back, in conjunction with the left side; the light should never be in the face.

Recitation-rooms should be of various sizes, from ten to fifteen square feet of floor space, and the lighting in the same proportion as that for class-rooms.

In the discussion of a paper on "School Hygiene" before the Medico-Legal Society of New York, with special reference to the "Influence of Vitiated Air and the Direction of Light upon the Eyes," a few years ago, Dr. Edward G. Loring, of New York, made the following pertinent remarks and citations:

"It is impossible to fix with any scientific exactness just the size that a window should be to give sufficient light for visual purposes, since this must vary with the exposure and surroundings of the room; but it has been reckoned in Germany that for a class-room containing 20 persons there should be at least 4000 to 6000 square inches of glass, which would give to each scholar from 200 to 300 square inches, or what would be represented by a pane of glass from 14 to 17 inches square. Such a room as this would be sufficiently lighted in any part. A room 20 feet square should not contain less than 70 to 80 square feet of glass, and it may be laid down as a rule that too much light cannot be obtained in a room, as all excess of glare can be guarded against by artificial shades, if properly applied.

"More light enters a room from the same amount of glass from the south than from the north, and southern, southeastern, or southwestern exposures are better than northern, northeastern, or northwestern exposures, especially for class-

rooms, and this, too, simply in regard to the amount of light, independent of the purifying influences of sunlight. . . .

"The light should not come from directly in front, and especially is this the rule when artificial light is used. For when the light comes directly in front of the person, the pupil of the eye becomes unduly contracted, which is equivalent to reducing the quantity of light, since less light enters the eye from the object viewed, while it is exposed to too much light reflected from surrounding objects, and from the direct rays from the source of illumination.

"Neither should the light come from directly behind, as the object then lies in the shadow of the body ; nor yet from the right side, because in writing the shadow of the hand falls across the page, and a moving shadow over a lighted surface not only reduces the quantity of light and leads to a stooping position, but it is also more annoying to the eye than a uniform reduction in the illumination of even a greater degree.

"The best direction for the light to come is from the left side, and from rather above than below the level of the head. Windows, therefore, should not run down too near the floor, as they often do in class-rooms and offices.

"I cannot agree with the opinion often expressed, that the best direction for the light to come from is from directly above.

"I cannot refrain from adding in this connection the conclusion founded on Dr. Cohn's elaborate investigations in regard to near-sightedness among school children in Germany. He thus formulates it :

"'The narrower the street in which the school-house was built, the higher the opposite buildings, and the lower the story occupied by the class, the greater the number of near-sighted scholars.'

"I should, then, from these considerations, say that the angle at which the light strikes the eye is important, and that it ought not to fall full in the face of the child, but first on the book or work, and be reflected into the eye." *

Seats and desks should be proportioned to the size of the pupil, and wholly independent. That is to say, each pupil

* New York Medico-Legal Society Proceedings, 1877.

should have a seat and desk unconnected with any other. Benches and long desks not only involve great inconvenience on account of the unavoidable jostle common to them, but they are detrimental to health as well as comfort. For girls, in particular, in sliding in between, and seating themselves, the dress is constantly liable to being pushed to one side, or getting bunched in such a way as to give an uneven seat, and consequent twist of the body, promotive of spinal and hip diseases.

The constraints required by the use of benches and long desks for both boys and girls, lest others sitting with them and using the same desks be disturbed, constantly involve a nervous and muscular tension alike disturbing to mental application and the healthy exercise of the functions.

The *sewerage* or house drainage, it seems hardly necessary to remark, should be arranged and effected in the best manner; but under no conditions whatever should the water-closets and urinals be grouped *within* the school-house, basement or otherwise; they should be in an entirely separate structure, but with convenient passageway protected from inclement weather. The material used in the construction of vaults and urinals should be of a kind, or in such wise protected, as to wholly prevent the absorption of moisture. The walls of privy vaults and cesspools, as ordinarily constructed of brick and cement, are offensive and dangerous. All such material in its crude state is absorbent and retentive of foul moisture and gases, and when used for this purpose it speedily becomes saturated with filth, subject to putrefaction, from which it cannot be cleansed.

Excrementitious matter thus retained is in more or less constant process of putrefaction, and besides evolving emanations inherent to its nature, it is ever liable to contract the seeds of disease from external sources, and when once so poisoned it becomes a hot-bed for the propagation of infectious diseases, well known to all observers to be more prevalent during the school term in American cities than at any other season of the year. And few are the medical practitioners of much experience who have not observed the relations of infectious diseases to badly conditioned school-house drainage.

To protect brick from absorbing moisture and gases when

thus exposed, in the construction of walls for privy vaults and cesspools, every brick of the floor and lining course, at least, instead of being laid up with mortar, should be immersed and allowed to remain for a while in a boiling-hot mixture of coal-tar and asphalt, and then laid up with tongs ; and, after finishing, the whole surface brushed over with the same mixture. The surface of cement walls should be brushed over in the same manner, and the process repeated until the porous surface is thoroughly saturated. Thus treated, the otherwise porous walls of such receptacles are rendered impervious and susceptible of being cleansed.

Urinal troughs, as ordinarily provided of wood and iron, painted and enamelled, only, as the case may be, are scarcely less odious than the water-closets. Every observer knows that both paint and enamel are easily destroyed by this use, and that wood and iron saturated with urine, as they soon become, are exceedingly malodorous. The best, and in the long run, the most economical materials for this purpose, are wooden troughs carefully covered with sheet copper, leaving no nail holes exposed. Lead is equally good as long as it lasts. But its softness and the irresistible impulse of school children to use their pocket-knives, are insurmountable obstacles.

Space, in this regard, is also an important condition of health and decency, which has hitherto received far too little attention.

The observations of the writer in this particular justify the conclusion that children frequently suffer from the restraints imposed upon them by insufficient water-closet accommodation ; and that the urgency and crowding, common to such insufficiency, in our city schools, especially, is fraught with both indecency and suffering.

All water-closet seats and urinals should be separated by partition boards. In the boys' apartment there should be at the least one seat and one urinal stall for every twenty-five pupils ; and in the girls' apartment at least one seat for every sixteen pupils.

A well-appointed *lavatory* and two *bath-tubs*, one each to the male and female departments, at least, provided with hot water as well as cold, would be an important and useful addi-

tion, promotive of the tidiness, healthfulness, and discipline of every city public school.

For country school-houses, where water carriage is not accessible, earth closets and boxes should always be preferred to privy vaults and cesspools. But it should be borne in mind that the earth used for such purposes is only a temporary deodorant and antiseptic, which prevents putrefaction so long only as it is kept perfectly dry. In damp warm weather, excrementitious matter thus retained is always liable to putrefaction and consequent dangerous results. Hence the earth *once* used should be promptly removed.

The *drinking-water* arrangements of public schools should, of course, be so placed as to be free from every possible source of contamination, abundant, convenient, and accessible without exposure to inclement weather.

Janitors should, under no circumstances, be provided with living quarters in school-houses. Besides the odors from cooking, and other inconveniences incident to housekeeping under such circumstances, the danger of infectious diseases is thereby increased.

The writer conceives it to be the province of a skilled architect to prepare the drawings necessary to comprehend the *conditions* of space, plans, and structure now submitted ; hence he makes no effort to that purpose.

VENTILATION.

The practical maintenance of the natural proportions of the atmospheric constituents as before described, should be the primary object of all means of ventilation.

The first condition of efficient ventilation is air-space. This has already been defined, in the suggestion of school-room dimensions, but no amount of space can make amends for lack of freshness, or confinement. *Stagnant* air is always dangerous to health, no matter how great the quantity.

Though the introduction of fresh air and the removal of that which is foul, are correlative operations, neither one of these processes can go on without the other going on at the same time ; but the agents in the operation are necessarily twofold, and therefore require separate consideration.

To neutralize the deleterious properties of respired air, every

person requires 2000 cubic feet of fresh air hourly, and with a less quantity contamination is sure to follow. To permit the passage of 2000 cubic feet of air hourly in ordinary atmospheric movement, requires an opening of five inches in the square. Therefore the equivalent of two such openings—one for the inlet of pure air, and the other for the exit of that which is impure—are necessary for every occupant of a school-room; and *fifty times as much* for as many pupils in a school-room of the dimensions given. This the writer believes to be practical, because when the temperature is such as not to require artificial heat, according to plans already suggested in relation to open spaces and windows, in conjunction with those now to follow, the facilities are abundant; and with artificial heat, such additional force is added to the air currents as to accomplish the purpose.

The ascent of foul air to the top of occupied rooms dictates the direction of the easiest means of exit. But in the use of artificial warmth, as, for example, by the fireplace, a new current is set up, or induced in the opposite direction, and with increased force, by means of the heated chimney.

The rarefaction and expansion of the air in a chimney flue by a fire, or an air-shaft heated with a gas-jet or string of steam-heated pipe, has the effect of creating air pressure at the base. The air in closest proximity thereto flows to take the place of that which is being removed, and thus sets up a current, which is usually (when so limited) called the draught of the chimney, the velocity of which is in proportion to the degree of heat and the height of the chimney. Thus it is by varying this means, as circumstances may require, that foul air may not only be removed, but an additional benefit obtained by reversing and adding to the ordinary movements, and creating a lively circulation.

There is usually more or less draught in a chimney, even without a fire, particularly when the air within the room is slightly warmer than that without, consequent upon the expansion of the warm air and an induced current from the chimney by the motion of the outside air across the top.

A knowledge of this fact, and a limited knowledge of pneumatics by boards of education, appear to have led to the common adoption of very feeble measures for the ventilation

of school-houses by means of mere shafts without heat, with openings near the floor, on the false conception that carbonic acid and organic matter exhaled by the breath, being heavier than the other atmospheric constituents, occupy the lowest stratum and require an opening thus situated for removal. While the truth is, the heated breath instantly ascends and the excess of carbonic acid which it contains never tends to separate and fall down in consequence of its greater weight, but by the law of the diffusion of gases it seeks to interpenetrate and spread itself equally all over the room, and would do so even were it at first wholly on the floor. The highest degree of impurity usually exists at the top and in the highest rooms of school-houses on account of the heated exhalations. But if the warm air on rising to the top of the room in cold weather were immediately allowed to escape, such an arrangement would seriously impair the facility of warming.

To meet all the changes and conditions of artificial temperature, experience teaches that escape flues for foul air should be both near the floor and near the ceiling, and flues for entry of fresh air four to five feet above the floor and on opposite sides of the room from the escape flues. When the weather is cold the escape flues at the top of the room should be closed; when it is warm, opened. Those near the floor should be opened at all times, and these, the exhaust flues, should be warmed by a gas jet or a line of steam-pipe to make them draw the foul air. With the heating so arranged, by steam or hot-water pipes, as to *keep the floor warm*, the escape flues for foul air may be wholly confined to a level with the ceiling.

For the fresh-air supply, the source from which it is drawn should always be carefully considered. The air which passes from furnaces into rooms should invariably be taken from out-of-doors and be conveyed in perfectly clean and smooth air-tight shafts to and around the base of the furnace. Preferably, the inlet of the shaft, or cold-air box, as it is commonly called, should be carried down and curved at a level (of its upper surface) with the bottom and full width of the furnace. Thus applied, the air is equally distributed for warming and ascent through the hot-air pipes to the apartments to be warmed. On the outside, the cold-air shaft should be turned up several feet from the surface of the ground to avoid dust; and it has

been advised by some to protect its mouth from dust by an "air-strainer," by a wire cloth, with a piece of unglazed cotton wadding laid over. This to be kept in place by a weight made of a few crossings of heavy wire, and the cotton changed whenever it appears to be filled with dust—every few weeks.

The same general conditions apply for the fresh air inlets to the coils for *indirect* steam heating. "Plenum ventilation," that which is applied by the use of machinery to public halls, institutions, etc., differs from that which has now been described only in degree by *forcing* a sufficient quantity of fresh air into the building by machinery.

WARMING.

The different modes of warming may be divided into three classes: Open fireplaces, stoves and furnaces, steam and hot water. The most universal of all mistakes in regard to warming in cold climates—no matter what the mode adopted—is to estimate the amount of fuel and heat-producing capacity solely with reference to warming. Ventilation is equally essential—aye, more—and it cannot be effected without expenditure of fuel. And the smaller the space to be warmed—the relative capacity to the number of occupants—the larger the proportion of heat required for ventilation, for the manifest reason that the air has to be changed more frequently.

1. Open fireplaces are only adapted to small school-rooms in mild climates. The heated air from the open fireplace or chimney-grate is available to the apartment for only about twelve per cent of the total amount of heat produced; all the rest passes up the chimney. Hence, in cold weather, the amount of heat available from this means, for warming the floors and walls, or reaching the remote corners of a room, is insufficient. And as Rumford put it, many years ago: "While the draughts chill one part of the body, the rest is roasted by the fire in the fireplace, and this cannot but be injurious to health."

The special merit of the open fireplace is good ventilation. The heated chimney from its use is the most effectual of all exhaust shafts for carrying off impure air; and it is frequently an important addition to the means of ventilation to school-rooms heated by other means. Some recent inventions in

open fireplace grates, by which the grate sets well out into the room and combines with a radiating surface and fresh air supply at the back, are great improvements in the economy of heat, and fulfil, in a remarkable degree, the best conditions for ventilation, either alone, when the weather will admit of it, or as adjuncts to furnaces.

2. Close stoves utilize from eighty-five to ninety per cent of the heat produced, and lose through the smoke-pipe only about as much as the open fireplace saves—ten to fifteen per cent. And herein lies the striking difference between the relative healthfulness of the atmosphere heated by a close stove and an open fireplace. The amount of air which passes through a close stove, heated with a brisk fire, is on an average equal to only about one-tenth of the capacity of the room warmed, and consequently such stoves require, if unaided, ten hours to effect a change of atmosphere in every such apartment. Thus stagnant and heated, the air becomes filled with the impurities of respiration and cutaneous transpiration.

Moisture, too, is an important consideration. The air, whether within doors or without can only contain a certain proportion of moisture to each cubic foot, and no more, according to temperature. At eighty degrees it is capable of containing five times as much as at thirty-two degrees. Hence, an atmosphere at thirty-two degrees, with its requisite supply of moisture, introduced into a confined place and heated up to eighty degrees, has its capacity for moisture so increased as to dry and wither everything with which it comes in contact : school furniture cracks and warps ; seams open in the moulding, wainscoting, and doors ; and ophthalmia, catarrh, and bronchitis are common complaints in schools where in sufficient attention is paid to the condition of the atmosphere ; while consumption and other chronic pulmonary diseases are thereby promoted.

But this condition of the air is not peculiar to close stoves. *It is equally true of any overheated and confined atmosphere*—no less applicable to the heat of steam-radiators than to that of stoves and hot-air furnaces.

The chief advantage of close-stove heat is, that the warming of the air is more quickly accomplished, more easily and more economically kept up than by any other means.

Sometimes, by the scorching of dust afloat in the atmosphere, an unpleasant odor is evolved by stove and furnace heat, which is erroneously supposed to be a special indication of impurity, caused by burning the air ; it is an indication of excessive heat in the stove. The air cannot be said to burn, in any true sense of the word, for it continues to possess its due proportion of elementary constituents, notwithstanding such accidents. Such is the close stove and its dangers under the most unfavorable conditions.

But stoves have been greatly improved in recent years. "Open fire stoves" combine the advantages of the open fireplace and the close stove, provide for fresh air and economize heat. The important improvements in stoves of this kind have not only well-nigh supplanted the old open fire-grate in supplying all that was ever claimed for it, but excel it in all the requisites for economy and comfort. These are provided with shafts conveying fresh air from the outside of the house to the bottom of the fire-grate and around a radiating surface of an inner shell. But the most important condition for the protection of health in stove heat, is provision for the removal of impure air. This is a much more difficult task than it is to obtain that which is pure.

The experiments of Pettenkofer have shown that under the common conditions of the atmosphere a very considerable exchange of gases takes place through dry plastered walls, brick and stone. But the cold felt by proximity to the wall or windows in a warm room is never due to this cause. It is due to the loss of heat by radiation from the body toward a colder surface. Yet every observer is aware of the force with which the outer air presses in through all crevices around doors and windows when great differences exist between the temperature of the outdoor and indoor air ; and the greater, if the indoor air is provided for means of escape with its impurities.

The essentials for healthy stove heat are a brick-lined fire-chamber, *exhaust-flue* for foul air, and provision for fresh air-supply.

A brick lining is requisite for the double purpose of preventing overheating, and for retaining heat in the stove. For the supply of moisture the means are simple and easy of control, but often inadequate.

An efficient air-shaft may be fitted to the commonest of close stoves by simply enclosing the smoke-pipe in a jacket—that is, in a pipe of two or three inches greater diameter. This should be braced around the smoke-pipe, leaving about an inch opening all around, and carried down to within six inches of the floor, or resting upon the floor on four prongs, left by cutting out the end in four deep notches. At its entry into the chimney a perforated collar should separate it from the smoke-pipe. For a stove with short horizontal smoke-pipe passing through a fire-board, the latter should always be raised about three inches from the hearth. A smoke-pipe thus jacketed, or fire-board so raised affords an efficient air-shaft for the escape of foul air.

The *introduction of fresh* air is a comparatively easy matter. In default of special provision, a strip of board three inches wide under the window-sash, closely fitted, provides for an inlet between the sash at the middle with a direction to the top of the room, and therefore not likely to subject any one to draught, while it promotes a free circulation of the air in the room.

Hot-air furnaces are simply enclosed stoves placed outside the apartments to be warmed, and usually in basements or cellars of the buildings in which they are used. The manner of warming is virtually the same as by *indirect* steam heat, by the passage of air over the surface of the heated furnace or steam-heated pipes, as the case may be, through flues or pipes provided with registers.

The most essential condition of satisfactory warming by a hot-air furnace is a good chimney draught, which should always be stronger than that of the hot-air pipes through which the warmed air is conveyed into the rooms; and this can be measured by the force with which it passes through the registers. A chimney draught thus regulated effectually removes all deleterious emanations; for if the chimney draught exceeds that of the hot-air pipes all the gaseous emanations from the inside of the furnace and from crevices, and if the furnace is of cast-iron and overheated all the gases around it on the outside, will be drawn into the chimney.

Closely connected with this requirement for the chimney draught is the regulating apparatus for governing the combus-

tion of fuel, the draught of the furnace. This should all be below the grate; there should be no dampers in the smoke-pipe or chimney, and all joints below and about the grate should be air-tight. The fire-pot should be lined with brick, and entirely within the furnace, but separate from it, so that the fresh air to be warmed cannot come in contact with the fuel chamber. A large heating surface of the furnace is a well-recognized condition of both economy and efficiency, and absolutely essential for effectual ventilation. As a rule, the calculation should be ten square feet of surface to every pound of coal consumed per hour when in active combustion; and the grate area should be about one-fiftieth of that of the heating surface. For the deficiency of heat, or the failure of some of the hot-air pipes in certain winds and weathers in large school-houses, or for specially exposed rooms, the best addendum is an open fire-grate, as before mentioned.

But with a view to the best means of distributing the heat, regulating the temperature and purity of the atmosphere, it is requisite that certain proportions be observed between the size of the shaft or shafts for the inlet of fresh air and the hot-air pipes for the distribution of the warmed air. The area of the smallest part of the inlet or inlets (for it is sometimes better to have more than one) should be about one-sixth of a square foot for every pound of coal estimated to be burned hourly in cold weather; and to prevent, in a measure, the inconvenience of one hot-air pipe drawing from another, the collective area of the hot-air pipes should not be more than one-sixth greater than the cold-air inlet. These proportions will admit the hot air at a temperature of about 120 degrees when at zero outside, and the velocity through the registers will not exceed five feet per second.

With these provisions in detail, and those with reference to ventilation applicable to all modes of warming in school-houses of moderate dimensions, hot-air furnaces may be made to supply the chief advantages of the more expensive methods of steam and hot water.

Steam heat is that which is accomplished by means of heat generated in the furnace of a boiler, either within or without the building to which it is applied, the heat being expended upon water, which is vaporized, and the steam generated

thereby distributed in small pipes as the medium of imparting the heat.

Steam-heating is divisible into two methods: *direct* and *indirect*. The first, or direct method, corresponds to the heat by stoves; and the indirect corresponds to hot-air furnaces. In the direct method the heater stands in the room which is to be warmed, and consists of coils of pipe, encased or otherwise, or of ornamental boxes. Its special advantage over the indirect method is the warming of the surrounding walls.

In the second, or *indirect* method, the coils or lines of pipe are placed in the basement or cellar, or in flues in the wall or under the floors, and the fresh air is warmed in the same manner as when it passes over a hot-air furnace.

The special advantages of steam heat over stove and furnace heat are, the facility with which it may be applied to large buildings; avoidance of the foul gases which may escape from an overheated or imperfectly regulated stove or furnace; and, when the boiler is outside the walls of the building to be heated, freedom from the risk of fire.

Its disadvantages are, for small area, expense in applying and conducting it; the length of time required in getting heat after starting the fire; and troublesome noises in the pipes due to the condensations and expansions of steam from irregularity in the distribution of heat and deviations in the lines of the pipe.

Hot-water heating is effected by the circulation of hot water through a system of pipes so arranged that the water, as it is heated, flows in accordance with the laws of specific gravitation. It may be distributed with the same facility as steam, over any extent of area, and has the advantage of communicating heat immediately that the hot water begins to flow—in much shorter time than is required for converting it into steam—and is wholly free from the noises of steam heat, which give it a special advantage for school-houses.

The *best* distribution of warmth by both *indirect* steam-heat and hot-water heat, is by running the pipes under the floor, or rather between double floors, and distributing the heat by means of perforations through the upper one. A constant supply of fresh air warmed and distributed by this means greatly promotes ventilation.

Finally, no matter what the system of heating, the importance of an abundant supply of *clean*, fresh air, and exhaust-shafts to carry off foul air, equally applies to all systems. The air-flues of all sorts should be perfectly smooth and air-tight, and should never form acute angles. Brick, plaster, and cement flues have absorbent surfaces, liable to contamination from any impurity in the air which passes through them, and may become sources of danger. Hence chimneys which are not also used for smoke-flues are not so good as smoother surfaces; but in any event, when used exclusively as exhaust-flues, should always be provided with gas-burners or a heated pipe.

The size of the flue for the withdrawal of foul air is an important consideration which should never be omitted. According to Morin, one of the most distinguished authorities on ventilation and warming, a flue eleven inches square and sixty-six feet high, provided with a seven-feet gas-burner, will withdraw 13,300 cubic feet of air per hour. But a fifty-feet burner in the same shaft will remove only 23,000 cubic feet per hour—so much higher temperature is required to produce the greater velocity. The size of the flue, therefore, should be so proportioned as to produce the necessary ventilation with a velocity through it of four or five feet per second. The draught will be in proportion to the square root of the height of the chimney.

SANITARY SURVEILLANCE.

Were it not the case that one of the most melancholy incidents in the history of public education in the United States is, that boards of education and school teachers have had to be compelled by law to introduce the study of physiology and hygiene into the public schools, the writer would consider much that he now submits, particularly in the first part of this essay, knowledge too common for consideration in this connection. But knowing by practical experience the vigor with which physiological studies and *even inquiries* with regard to unsanitary conditions have been and are still resisted, by some boards of education, it has appeared to him to be necessary to comprehend such knowledge herein, as will, if possible, tend

to strengthen the effort to overcome such resistance, based, as it is well known to be, on the want of such information as that herein comprehended.

If school teachers and boards of education generally practised the conserving of the energy of school life ; if overwork were generally followed by speedy relief ; if the oppression produced by a close atmosphere always led to efficient ventilation ; if it were not the practice of some boards of education to even resist the investigations and efforts of the health authorities to prevent the introduction and spread of infectious diseases ; if even the wants and necessities of nature were not insufficiently provided for ; if the proper care and education of the senses were not so completely ignored, that school teachers and boards of education generally seem, practically, not to know that the sensations are the natural guides to health, and, when not blunted by long abuse, the only dependence and trustworthy resources for acquiring and using education : if all these conditions—and the list might be extended —did not call for *independent sanitary surveillance*, the writer would gladly defer to that exclusive management of our public schools by the boards of education which would add a sanitary superintendent to the list of appointees.

But, constituted as our boards of education are, with few exceptions, though there may be some members who are physicians, it is impracticable to secure competent sanitary supervision under the direction of or subordinate to them. They are generally divided into committees, with special charges : on "sites," "construction," "heating," "ventilation," "health," etc. ; and on "school-houses," with the special surveillance of particular schools, severally, to the different committees. All such committees are exceedingly jealous of their rights, and resist the interference of their fellows. Hence, even inquiries are commonly met as if reflecting insinuations of shortcoming.

It is manifest that no sanitary service under the direction of such a board can be efficient. Sanitary surveillance should, therefore, be exercised by the Health Department of every city, town, county, or district, as the case may be, with that special care which the nature of the service demands.

EDITOR'S TABLE.

☞ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, 113A Second Place, Brooklyn, N. Y.

Subscribers are reminded that with this number the twenty-third volume closes, and that the more strictly they conform to the conditions of detachable order on advertising page xv., the BETTER THE SANITARIAN WILL BE, because the editor will be the more free from disturbing anxieties and the better able to grasp and discuss all subjects in its purview. *Please do not wait for bills.*

THE SANITARIAN'S promises for the future are reiterated on the second page of cover of this number, by the republication of its first prospectus, April 1st, 1873; long enough ago for THE SANITARIAN to have become the oldest and, during the while, almost the only periodical in the English language devoted to sanitation without collateral benefits.

No disparagement of our numerous contemporaries, more or less devoted to the promotion of sanitation, is meant by this implication; but, on the contrary, it is gratifying to take note of the growth of interest in sanitation since the advent of THE SANITARIAN, to such a degree as to make it a popular subject for the promotion of trade and material resources in a great variety of ways that were not before thought of.

Notwithstanding, THE SANITARIAN proposes to pursue the even tenor of its way without any entangling alliances; to be true in the strictest sense to its declared purposes, and to strive more and more to merit the encomiums that have been passed upon it by the press and the best sanitary authorities. Apropos, at the time of this writing, and published by permission:

WILMINGTON, N. C., November 30, 1889.

Editor of THE SANITARIAN:

"Please send THE SANITARIAN to the following members of North Carolina Board of Health for the ensuing year: ——.

"The members of our board have had a turn at nearly all the sanitary papers in the country, and prefer yours always,

a sort of compliment editors seldom get, and I know you will appreciate it.

"Yours very truly,

"THOMAS F. WOOD,

"*Secretary North Carolina Board of Health.*"

THE PROGRESS OF INFECTIOUS DISEASES AND MORTALITY RATES AT THE MOST RECENT DATES, BASED UPON OFFICIAL AND OTHER AUTHENTIC REPORTS.

ALABAMA.—*Mobile*, 40,000: Reports 78 deaths during October, of which 14 were under five years of age. Annual death-rate, 23.4 per 1000. From zymotic diseases, 14, and from consumption, 7.

CALIFORNIA.—For the month of October, 1889, the Secretary's abstract of the reports received from 101 cities and towns, with an aggregate population of 846,300, the number of deaths was 1007. Annual death-rate, 14.4. Deaths from consumption during the month, 147. From zymotic diseases: Diphtheria and croup, 35; typhoid-fever, 48; typho-malarial-fever, 4; cerebro-spinal-fever, 7; diarrhœal diseases, 53; whooping-cough, 4; scarlatina, 4.

San Francisco reports for the fiscal year ending June 30th, 1889: Population, 330,000; deaths, 5729, of these 559 were Chinese. Death-rate, 17.36—of the Chinese (30,000), 18.63; exclusive of Chinese, 17.23. Deaths from zymotic diseases, 637—251 less than in 1888—chiefly: diphtheria and croup, 169; typhoid-fever, 138; cholera infantum, 90; cerebro-spinal meningitis, 29; other zymotics, 206. Nine hundred and thirty or 16.2 per cent of the deaths from all causes were caused by consumption.

DISTRICT OF COLUMBIA.—Total deaths during four weeks ending October 26th, 379, of which 133 were under five years of age. There were 157 deaths in the colored population. Annual death-rate, 19.97. Zymotic diseases caused 101 deaths, and consumption, 45.

ILLINOIS.—*Chicago*, 1,100,000. For the month of October the Commissioner of Health reports: Total number of deaths, 1583, of which 656 were under five years of age. Annual

death-rate, 17.27 per 1000. From zymotic diseases there were 406 deaths, and from consumption, 139.

INDIANA.—Seventh Annual Report of the State Board of Health for the fiscal year ending October 31st, 1888: "Following the dry weather of 1887 there was considerable typhoid-fever, . . . but the mortality was rather light considering the number of cases. There has been no serious epidemic. Small-pox made its appearance in a few places, . . . but was not permitted to spread beyond the limits of the original cases."

The State has been divided into districts and a member of the board placed in charge of each. From an excerpt of the reports of these members and of the one hundred and fifty-five organized local boards of health, the State appears to have been remarkably free from preventable sickness throughout the year.

A tabulated statement of marriages and births for the year ending September 30th, 1888, is given, but the returns are confessedly so incomplete as to be well-nigh valueless, except to show the necessity for more stringent laws for their enforcement. Several excellent essays on sanitary subjects add to the value of the volume for circulation among the people for educational purposes.

LOUISIANA.—*New Orleans*, 254,000: During the four weeks ending October 26th there were 424 deaths, of which 107 were under five years of age. Annual death-rate per 1000, whites, 19.44; colored, 27.43; total population, 21.77. From zymotic diseases there were 70 deaths, and from consumption, 77.

MAINE.—Fourth Annual Report of the State Board of Health for the year 1888: The first, and, indeed, continuous subject of attention in this report is diphtheria, though apparently, as compared with other States, without any unusual prevalence. The number of cases reported was 126 from 430 towns. Typhoid-fever was reported from 181 towns; scarlet-fever from 92.

Water analysis has also been the subject of continuous attention, and the results of much practical utility.

Small-pox was reported at Cumberland Mills, March 15th, and on investigation found to have been present in the village for nearly two months. The source of the disease was traced

to a worker in the *rag-room* of the Cumberland *paper-mills*, where rags known as "English whites" or "English outshots," were worked, and where Japanese rags had been handled.

Typhoid-fever and the means by which it is commonly spread, and filth storage in privy pits promotive of it, appear to have been the chief subjects of attention on the part of local boards of health throughout the State.

"Light Gymnastics for Schools," is the subject of a contribution of unusual excellence by Dr. F. N. Whittier, of Bowdoin College. The admirable "Report of the Committee on the Pollution of Water Supplies," by Charles Smart, M.D., U. S. Army, at the meeting of the American Public Health Association at Milwaukee, 1888, is also added.

Dr. F. H. GERRISH has resigned as a member and as President of the Board, made necessary by the claims of his professional work, and Dr. C. D. SMITH, of Portland, has been appointed to fill the vacancy.

MARYLAND.—*Baltimore*, 500,343 : During the three weeks ending October 26th, there were 462 deaths, of which 166 were under five years of age. Annual death-rate, 16.04 per 1000. There were 73 deaths from zymotic diseases, and 67 from consumption.

MASSACHUSETTS.—Twentieth Annual Report of the State Board for the year ending September 30th, 1888, embraces the following topics : General Work of the Board ; Protection of the Purity of Inland Waters ; Food and Drug Inspection ; Trichinosis ; Opium Habit ; Biological Inquiries as to the Quality of the Air in Hospital Wards ; Summary of Weekly Mortality Reports ; Health of Towns.

In the continued chemical and bacteriological examinations of the water-supplies and the experiments in filtration of water and sewage through different soils, the important results ascertained are that continuous filtration ultimately accomplishes but little purification of sewage, and that intermittent filtration is effective only when through gravel or sand in large quantities.

Of infectious and communicable diseases small-pox broke out during the year seventeen times, in nine cities and towns ; there were in all 32 cases, with 5 deaths. Six of the cases

occurred in *paper-mill towns*, and of these four were among paper-mill operatives. "The rags used at this mill for paper-making were a mixture of foreign and domestic, in the proportion of about one-tenth of the former to nine-tenths of the latter. The domestic rags came mostly from New York and Brooklyn."

It is remarkable that, on the outbreak of small-pox or any other disease in the Massachusetts paper-mills, where a larger quantity of foreign rags are used than in any other State in the Union, and where small-pox more frequently breaks out than in any mills elsewhere, there is always found a sufficient quantity of domestic rags to account for it.

"We have in our State," said Dr. H. P. Walcott, before the American Public Health Association, at Washington, four years ago, "statistics covering thirty or forty years in regard to baled rags. In all that time there has not been a particle of evidence that any disease has ever been imported in foreign rags. There has not been a suggestion of it. The only diseases that have ever been noticed have been those which have been brought in mohair, but with that exception I know of no other. All our troubles have come from domestic rags."—*Public Health*, vol. xi., p. 377.

The experience of paper-mills elsewhere, besides those of Maine, as above reported, is different.

Diphtheria prevailed with about the same severity as during the preceding year. The total number of deaths from it (and croup) was 1248.

Scarlet-fever was less prevalent—504 deaths; measles, 65; whooping-cough, 132. Typhoid-fever caused 482 deaths; diarrhœal diseases, 1813. Total mortality from all causes, 23,259; 3121 or 13.42 per cent of the deaths were caused by consumption. Average weekly death-rate for the year, 21.23.

Trichinæ in swine is the subject of special report by Professor E. L. Mark, of Harvard University. Of 3064 hogs raised near Boston 12.86 per cent were found to be trichinous; and 234 from public institutions, 17.95 per cent, as compared with 3.9 per cent of 8769 Western hogs examined by Dr. F. S. Billings. Professor Mark believes that the uncooked offal eaten by hogs, and not rats, is the source of the infection.

Food and drug adulteration continues to diminish under the administration of the Food and Drug Act of six years ago,

and the exceptions to pure, unsophisticated milk are year by year growing less numerous.

The report is altogether replete in information of practical utility to the health service and the public, *not* excepting the danger of handling foreign rags that have not been disinfected.

Boston, 420,000: Reports for October 804 deaths, of which number 259 were under five years of age. Annual death-rate, 22.97 per 1000. From zymotic diseases there were 141 deaths, and from consumption, 120.

MICHIGAN.—For the month of October, 1889, compared with the preceding month, the reports indicate that scarlet-fever, puerperal-fever, influenza, pneumonia, diphtheria, pleuritis, and typhoid-fever increased, and that cholera infantum, cholera morbus, dysentery, cerebro-spinal meningitis, diarrhœa, and measles decreased in prevalence.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of October, 1889, at sixty-three places, scarlet-fever at fifty-four places, typhoid-fever at one hundred and thirteen places, and measles at fifteen places.

Reports from all sources show diphtheria reported at twenty-nine places more, scarlet-fever at thirty-four places more, typhoid-fever at sixty-six places more, and measles at eight places more in the month of October, 1889, than in the preceding month.

Detroit reports for the year ending June 30th, 1889: Estimated population, 230,000; deaths (exclusive of premature and still-births), 3608; under five years of age, 912; from zymotic diseases, 1954—54 per cent; 320 or 8.8 per cent from consumption. Of the unusually large proportion of deaths from zymotic diseases, the most prevalently fatal were: diarrhœal, 417; diphtheria (and croup), 239; typhoid-fever, 71; malarial-fevers, 41; whooping-cough, 49; scarlet-fever, 46; erysipelas, 24. Death-rate, 15.65—small considering the large percentage from zymotic diseases, and suggestive of an over-estimated population. For the month of October, population estimated at 250,000: 300 deaths, of which 72 were under five years of age. Annual death-rate, 14.12 per 1000. From zymotic diseases there were 79 deaths; from consumption, 23.

MINNESOTA.—*St. Paul*, 180,000: Reports for October 137 deaths, of which 56 were under five years of age. Annual death-rate, 9.13 per 1000. From zymotic diseases, 57, and from consumption, 15.

MISSOURI.—*St. Louis*, 450,000: Reports for October 667 deaths, of which number 255 were under five years of age. Annual rate of mortality, 17.78 per 1000. From zymotic diseases there were 151 deaths, and from consumption, 49.

NEW HAMPSHIRE.—The following contagious and infectious diseases were reported to the State Board of Health for the month of October:

Diphtheria: Manchester, 14; Acworth, 2; Canaan, 3; Nashua, 1; Canterbury, 1; Rochester, 1; Marlow, 3; Walpole, 1; Claremont, 5; and Keene, 48, with 12 deaths. This makes 73 cases of diphtheria in Keene since September 1st. The health officer says: "Private funerals have been ordered, prophylactic measures enforced as much as possible, and in some cases attendants have been furnished for the sick."

Scarlet-fever: Manchester, 14; Concord, 3; Canaan, 1; Keene, 2; Tilton, 6; and Hooksett, 2.

Typhoid-fever: Manchester, 3; Concord, 3; Henniker, 1; South Newmarket, 3; Nashua, 9; Canterbury, 1; Rochester, 1; Laconia, 2; Pittsburg, 1; Weare, 1; and Amherst, 2.

NEW JERSEY.—*Hudson County*, 282,254: During the month of October there were 508 deaths, of which number 194 were under five years of age. Annual death-rate, 21.6 per 1000. The deaths from zymotic diseases numbered 111, and from consumption, 54.

Paterson, 85,000: Reports 114 deaths during October, of which number 40 were under five years of age. Annual death-rate, 16.0 per 1000. There were 21 deaths from zymotic diseases, and 19 from consumption.

NEW YORK.—The *Bulletin* of the State Board of Health for the month of October states that of the 8050 deaths during the month, 6546 occurred in the cities and towns specified, the population of which is 4,015,000, giving an annual death-rate for them per 1000 of 19.20. The remaining 1504 deaths are reported from about 500 rural towns. Of the former

(urban) class, 31.67 per cent, and of the latter (rural) class, 14.33 per cent of the deaths occurred under the age of five years; 18.56 per cent of the former and 14.00 per cent of the latter class were from zymotic diseases. The mortality from diphtheria has increased earlier than last year, but is yet much lower than in the winter months; numerous epidemics have occurred, and the number of localities is much increased; 7.89 per cent of the *urban* mortality and 3.52 per cent of the *rural* were from this cause. Typhoid-fever varies little; it caused 2.80 per cent of the *urban* and 5.18 per cent of the strictly *rural* mortality. Consumption caused 126.20 per 1000 of the deaths; 176.32 per 1000 above the age of five years.

New York, 1,571,558: Total deaths, 2724—926 under five years. Annual death-rate, 20.38. From zymotic diseases there were 436 deaths, and from consumption, 412.

Brooklyn, 821,525: Total deaths, 1305—454 under five years. Annual death-rate, 18.68. From zymotic diseases there were 224 deaths, and from consumption, 162.

Buffalo, 230,000: Total deaths (four weeks ending October 26th), 358—171 under five years. Annual death-rate, 20.23. From zymotic diseases there were 75 deaths, and from consumption, 28.

Rochester, 130,000: Total deaths, 154—38 under five years. Annual death-rate, 14.22. From zymotic diseases there were 23 deaths, and from consumption, 25.

Albany, 103,000: Total deaths, 207—62 under five years. Annual death-rate, 24.11. From zymotic diseases there were 57 deaths, and from consumption, 24.

Syracuse, 80,000: Total deaths, 114—38 under five years. Annual death-rate, 17.10. From zymotic diseases there were 25 deaths, and from consumption, 16.

OHIO.—*Cincinnati*, 325,000: Reports for October 449 deaths, of which 139 were under five years of age. Annual death-rate, 16.57 per 1000. From zymotic diseases there were 112 deaths, and from consumption, 55.

Mansfield reports for the year ending February 28th, 1889: Population, 15,000; deaths, 99; death-rate, 6.6—probably the lowest of any similar population in the State.

PENNSYLVANIA.—*Philadelphia*, 1,040,245: Reports for four weeks ending October 26th, 1318 deaths, of which 419 were

under five years of age. Annual death-rate, 16.44 per 1000. From the principal zymotic diseases there were 115 deaths, and from consumption, 191.

Pittsburg reports for the year ending January 31st, 1889: Estimated population, 220,000; deaths, 4189—1943 or 46 per cent under five years of age; 513 or 12.2 per cent were caused by infectious diseases, and 363 or 8.67 per cent by consumption. Of the deaths from zymotic diseases there were from typhoid-fever, 191; diphtheria (and croup), 199; whooping-cough, 64; measles, 55; scarlet-fever, 45; cerebro-spinal-fever, 17; erysipelas, 14. Death-rate, 19.

RHODE ISLAND.—Eleventh Annual Report of the State Board of Health for the year 1888, and Report upon the Registration of Births, Marriages, and Deaths in 1887. Excepting thirty-five pages devoted to tuberculosis, this report is chiefly statistical. There has been no epidemic of special magnitude during the year—the nearest approach to it has been the exceptional prevalence of typhoid-fever in the town of Bristol during the months of July, August, and September. There was also a sudden outbreak of this disease, of short duration, however, in Providence during the latter part of November. "Typhoid-fever ranks at about nine in the numerical order of the most prominent causes of death in Rhode Island," and is chiefly communicable by means of water polluted by the discharges from the bowels of persons sick with the disease.

A special report on *tuberculosis*, in virtue of a resolution of the State Assembly, comprises a concise history of the disease and a lucid sketch of the recent advances made in the study of its etiology and the means of preventing its spread. According to the statistical report for 1887, the number of deaths from consumption in the State during that year was 710—116 less than in the preceding year, and less than in any year since 1881. 266 were of American parentage, and 444 of foreign.

The average annual percentage of deaths from consumption to all other stated causes, in periods of five years each, from 1860 to 1884, inclusive, and in each of the last three years has been as follows: 1860–64, 18.70; 1865–69, 18.74; 1870–74, 15.56; 1875–79, 15.83; 1880–84, 14.80; 1885, 14.42; 1886, 14.12; 1887, 11.19—a gain surely no less remarkable than gratifying, as the result of practical sanitation.

The total numbers of births, marriages, and deaths per 1000 of population, respectively, for the year 1887, were as follows: 24.2; 18.0; 19.9. Divorces during the year, 248—*one divorce* to every eleven and four tenths marriages.

Monthly Bulletin reports for October, 1889, typhoid-fever in more than half of the towns of the State; diphtheria from seven localities; measles increased 30 per cent over previous month, and whooping-cough prevalent in Pawtucket, Woonsocket, and vicinity of Rockland.

Providence, 127,000: Reports for October 185 deaths, of which number 45 were under five years of age. Annual death-rate, 18.14. From zymotic diseases there were 27 deaths, and from consumption, 23.

TENNESSEE.—The principal diseases, named in the order of their greater prevalence, in the State during October were: Malarial-fevers, pneumonia, dysentery, consumption, bronchitis, tonsillitis, cholera infantum, diarrhœa, and rheumatism.

Typhoid-fever is reported in the counties of Campbell, Carroll, Chester, Davidson, Fayette, Grundy, Hamilton, Hancock, Hardin, Henry, Houston, Knox, Macon, McMinn, Montgomery, Moore, Roane, Robertson, Shelby, Sumner, and Weakley. Diphtheria in Davidson, Hamilton, Knox, Macon, Madison, McMinn, Shelby, and Wayne. Scarlet-fever in Davidson, Franklin, Hardin, Knox, Shelby, and Williamson. Mumps in Crockett, Fayette, and Wayne. Erysipelas in Fayette, Gibson, and Madison. Croup in Decatur, Hawkins, and Macon. Whooping-cough in Davidson and Sumner. Measles in Crockett and Sumner. Cerebro-spinal meningitis in Carroll and Shelby. Meningitis in Shelby. Roseola and chicken-pox in Maury.

Chattanooga,	white,	6.66;	colored,	14.76:	9.30
Clarksville,	"	9.60;	"	24.00:	15.00
Knoxville,	"	9.57;	"	14.32:	10.54
Nashville,	"	11.47;	"	21.61:	15.09
Memphis,	"	18.26;	"	23.27:	20.53

WISCONSIN.—*Milwaukee*, 210,000: Reports 254 deaths in October, of which 69 were under five years of age. Annual death-rate, 14.5 per 1000. From zymotic diseases there were 66 deaths, and from consumption, 20.

CANADA.—*Montreal* reports for the year 1888: Population, 201,743; births, 8658—42.91 per 1000 of population; marriages, 2204—10.92 per 1000 of population; deaths, 5824—28.86 per 1000 of population.

Sixteen hundred and ten or 27.6 per cent of the deaths were caused by zymotic diseases: diphtheria (and croup), 578; diarrhœal, 740; typhoid-fever, 94; other fevers, 26; cerebro-spinal meningitis, 23; measles, 37; whooping-cough, 17; scarlet-fever, 9. Five hundred and thirty-nine or 9.25 were caused by consumption.

JAMAICA.—Registrar-General reports for the year ending September 30th, 1888: Population by census of 1881, 580,804, but taking the natural increase since, and allowing for the extensive emigration to the Isthmus of Panama and Port Limon, which subsequently set in, the mean population, as calculated at the end of the official year, September 30th, 1888, was 617,446. Marriages, 3353—5.4 per 1000, of whom 57.3 per cent were unable to write their names. Births, 24,025—39.1 per 1000, the highest rate ever reached; 14,570 or 60.6 per cent were illegitimate. Deaths, 13,696—22.3 per 1000. Eleven thousand and eighty-eight or 80.9 per cent of the deaths were cases in which no medical testimony was procured as to cause of death.

Kingston (including Port Royal): Seventy-five per cent of the deaths were returned on medical certificates; the number of deaths during the year was 1286. The death-rate, based upon an approximate estimate of the present population (not stated), is about 25.0 to 26.0 per 1000. Three hundred and seventy-two or 29.18 per cent were caused by zymotic diseases—chiefly fevers, 159 (2 of yellow-fever); diarrhœal diseases, 148.

YELLOW-FEVER still lingers at Key West, it appears, by report of State Health Officer, Joseph Y. Porter, M.D., November 16th, to Surgeon-General J. B. Hamilton. Fortunately the lateness of the season precludes all danger of an epidemic this year.

THE CHOLERA in Mesopotamia, according to the reports of Dr. Gabuzzi to the *Journal d'Hygiene*, appears to be abating. Writing from Constantinople, October 23d, he says:

"Telegrams from Bagdad confirm the reports we have given of the rapid decrease of the epidemic. Although the deaths

from cholera during the week were 199, and exceeded by 51 the number of the preceding week, the increase was caused by including in the report 107 deaths which occurred in the little town of Eybil. The sanitary condition of the caravan which was quarantined at Bagdad was found satisfactory and was granted a clean bill of health."

October 30th: "The number of deaths from cholera in all parts of Mesopotamia has decreased from 199 to 111 during the past week. No death has been recorded in Bagdad since October 19th.

"In consequence of the appearance of cholera at Revendouz, on the Turco-Persian frontier, the cordon of defence established on the little Zarb, a tributary of the Tigris, has been carried farther north on the greater Zarb.

"In Persia cholera has spread over the greater part of the western section of the country as far west as Hamadan.

"At the present time the two separate groups: 1st, Mohamara, Fellahiyé, Chouchter, Beïbehan; 2d, Kesrichirin, Kermaneab, form but one, and the disease seems to be gaining ground."

On November 5th the accounts were more cheering; he writes:

"This week only 84 deaths from cholera were registered. No new locality has been invaded. It is therefore evident that the intensity of the epidemic is abating, and that it is not so rapidly fatal as at first."

The accounts from Teheran and the reports from Persian Kurdistan are in like manner more satisfactory.

The following interesting fact relating to the influence of locality and exclusion has been pointed out by the physician at Deir: "The Arabs who were encamped on the Euphrates between Anak and Aboukemal, withdrew to the mountains on the outbreak of the epidemic, and have not allowed any stranger to enter their encampment, which has remained entirely exempt from the disease."

"HIPO," now prevailing as an epidemic in St. Petersburg, is said by Dr. Zdecana, of that city (in *Las Novedades* of December 5th), to be the forerunner of cholera, the same disease having been immediately precedent to the five invasions of cholera there heretofore. T. P. C.

LITERARY NOTICES.

A TREATISE ON THE DISEASES OF THE NOSE AND THROAT, IN TWO VOLUMES. By FRANK HUNTINGTON BOSWORTH, A.M., M.D., Professor of Diseases of the Throat in the Bellevue Hospital Medical College, New York; Consulting Physician to the O. D. P. Department of the Bellevue Hospital; Fellow of the American Laryngological Association, of the American Climatological Association, of the New York Academy of Medicine, of the New York Laryngological Society, of the Medical Society of the County of New York, etc.

VOLUME ONE. DISEASES OF THE NOSE AND NASO-PHARYNX. 8vo, pp. 670, with 4 colored plates and 182 wood-cuts. New York: William Wood & Co.

The comprehensiveness and size of this volume is indicative alike of the exclusiveness of the specialty and the amount of literature upon it during recent years, since it has become apparently necessary to include the anatomy and physiology of the organs concerned. Doubtless this will be an esteemed feature of the work by all who would take up the subject *de novo*, without first acquiring a knowledge of the elements of medical practice generally; but this feature seems to us to invite an innovation not by any means calculated to promote the best practical results.

It comprises, besides, an almost embarrassing fulness of detail, freely using, but always duly crediting other writers, insomuch that, however valuable it may be as a foundation treatise containing everything essential to the subject, as it certainly does, the general practitioner who refers to it will often wish that the author had possessed more of the faculty of condensation. But its encyclopædic nature has its advantages—there is but little, if anything, of value beyond.

HYPNOTISM: ITS HISTORY AND PRESENT DEVELOPMENT. By FREDRIK BJÖRNSTRÖM, M.D., Head Physician of the Stockholm Hospital, Professor of Psychiatry, Late Royal Swedish Medical Councillor, etc. Translated from the second

Swedish edition by Baron Niles Pope, M.G. Pamphlet, pp. 126. Price, 30 cents. New York: Humboldt Publishing Co.

All who would understand the significance of "Somnambulism," "Animal Magnetism," "Mesmerism," and the "Works of the Devil"—by the arts of impostors—from a scientific point of view, should read this pamphlet. They will be the better able to appreciate the tricks of the vilest of trades and the credulities of the ignorant.

THE NATIONAL TEMPERANCE ALMANAC AND TEETOTALER'S YEAR-BOOK FOR 1890 has just been issued by the National Temperance Society. It contains the latest official statistics of the drink traffic; internal revenue returns; U. S. standing army of liquor-dealers; beer and liquor statistics; death-rate and intoxicating liquors; quantities of distilled spirits, wines, and malt liquors, and the average annual consumption per capita of population; a full list of temperance periodicals, State Good Templars, Sons of Temperance, Temples of Honor, Woman's Christian Temperance Unions, etc., together with a list of the various temperance organizations in New York City and Brooklyn. Price, 10 cents; $1 per dozen. New York: J. N. Stearns, 58 Reade Street.

THE MAKING OF A GREAT MAGAZINE. . . . BEING AN INQUIRY INTO THE PAST AND THE FUTURE OF HARPER'S MAGAZINE. With specimen illustrations and a partial analysis of the contents in recent years. New York: Harper & Brothers.

A pamphlet of forty pages consisting of an excerpt of a few only of the articles and illustrations which have contributed to make *Harper's* famous wherever the English language is spoken and the best literature appreciated.

As well said by the New York *Journal of Commerce*: "*Harper's Magazine* ranks first in the world in circulation. Its history is a large part of the literary history of the nineteenth century."

HARPER'S for December is an ideal Christmas number. It presents to its readers splendid gifts of story, essay, and illustration; and it has selected these treasures of its bounty with a rare appreciation of what people in their holiday humor most wish to receive.

THE CENTURY for December is the beginning of a new volume, and opens with a series of unpublished letters written by the Duke of Wellington, in his very last days, to a young married lady of England. These letters present the Iron Duke in a very attractive light—amiable and unpretending; the careful guardian of the children of his friend in their childish illnesses. Besides pictures of the duke's residences, etc., there are three portraits of Wellington; the imposing full-length picture by Sir Thomas Lawrence being used as frontispiece.

Mr. Charles Barnard's illustrated article on "The New Croton Aqueduct" is the first full account of that marvellous and unique engineering work. A striking feature of this paper is Mr. Barnard's exposé of the frauds in the building of the aqueduct—the empty places in the masonry being shown by means of photographs.

Besides the Christmas and other poetry of this number, Mr. Stedman has a poem inspired by Fortuny's famous "Spanish Lady," and accompanied by an engraving of the picture.

The chapters of the Lincoln Life deal with the fall of Richmond and Lincoln's visit to the abandoned capital. Mrs. Van Rensselaer gives briefly her impressions of the French Exhibition; and the editorial pages come to the defence of civil service reform.

OUR LITTLE ONES AND THE NURSERY began a new volume with the November number. *Our Little Ones* is ten years old, and its million readers are still its strongest friends. It is very carefully edited by a well-known author. It is largely used in schools and kindergartens, and is an educator of the highest character in both family and school, not only of the mind, but also of the taste of its little readers. Monthly: $1.50 a year. Boston, Mass.: Russell Publishing Co.

SIXTH ANNUAL REPORT OF THE BUREAU OF STATISTICS OF LABOR OF THE STATE OF NEW YORK, FOR THE YEAR 1888. CHARLES F. PECK, Commissioner. Albany, N. Y.

This volume is wholly devoted to strikes and boycotts. Points out how they have been brought about and temporarily overcome, but with the question still open whether the em-

ployer or employé shall alone fix the terms and methods of labor, or whether both shall submit to "union" dictation.

PROCEEDINGS AT THE SEVENTH ANNUAL SESSION OF THE NATIONAL CONVENTION OF CHIEFS AND COMMISSIONERS OF THE VARIOUS BUREAUS OF STATISTICS OF LABOR IN THE UNITED STATES, HELD AT HARTFORD, CONN., JUNE 25TH–27TH, 1889.

A pamphlet of ninety-six pages, comprising the personal experiences of the members present and a comparison of results; but without any conclusions on preferred methods.

CONNECTICUT STATE MEDICAL SOCIETY PROCEEDINGS, 1889. N. E. WORDIN, A.M., M.D., Secretary. Pp. 298.

Of a baker's dozen of essays and reports in this thick pamphlet, two only are on subjects of preventive medicine—"The Pollution of Water and Ice," by G. H. Jennings, M.D., of Jewett City; and "Poisoning by Water Gas," by Edwin A. Downe, M.D., of Middletown. Dr. Jennings's paper comprises the prevalence and common danger of water and ice pollution, as frequently reported during recent years, together with his own observations, and several analyses of water from melted ice, all showing the commonness of the danger and the necessity of stringent laws for its prevention.

Dr. Downe points out the alarming increase in the fatality of asphyxia since the employment of "water gas" as an illuminant, and the pernicious effects if small quantities are inhaled. He considers its composition and essentially poisonous nature, and, notwithstanding, the rapid increase in its manufacture and use in recent years. He summarizes the statistics on the subject, showing that the number of deaths caused by asphyxia from illuminating, are twenty times greater from water gas than from coal gas.

As for the rest, the papers, reports, and discussion on curative medicine and measures, and matter of professional interest, generally, the Society is evidently abreast with the progress of the time and alive to the importance of active Society work.

TRANSACTIONS OF THE LOUISIANA MEDICAL SOCIETY, 1888. P. B. MCCUTCHON, Secretary. Pp. 364. New Orleans.

Of the reports of committees on the several subjects into which the work of the Society is divided, precedence is given to that on State Medicine and Legislation, by J. W. Dupprée, M.D., Chairman. Special reference is made to the success of the effort in establishing the Chair of "Anatomy, Physiology, and Hygiene" in the Louisiana State University and Mechanical College, and after one year's successful operation, the singularly inappreciative action of the Board of Administrators in abolishing it as useless and unnecessary! In view of such an act the question is asked whether it is worth while for the Society to continue its effort with the Legislature to have the rudiments of physiology and hygiene taught in the public schools and universities of the State. Attention is urged to the inadequate provision for the proper care of the occupants of charitable and other public institutions, needful legislation for regulating the practice of medicine and for greater scope to the State Board of Health in every part of the State.

Professor Joseph Jones, M.D., contributes an elaborate paper on the "Relations of Quarantine to Commerce," and the success of his own efforts, in particular, in carrying the claim of the State's right to collect fees from vessels for the maintenance of quarantine to, and securing the judgment of the Supreme Court of the United States justifying the claim. To him alone rightly belongs the credit for securing this decision. By this decision, January 21st, 1884, the State Board of Health of Louisiana secured the payment of several thousand dollars due it, on account of expenses incurred for the exercise of sanitary restrictions. But this was but a small part of the benefit. Health authorities throughout the country had hitherto accepted the superficial construction of the laws governing commerce, that such fees were a tax on commerce, and therefore unconstitutional.

The benefit of the decision, correcting that interpretation, has been far-reaching and, withal, positively beneficial to commerce, lessening the tax proportionally with the degree of cleanliness of vessels. At the Port of New York, for example, on this decision, the State law by which the health officer had been paid in fees for boarding and other services—thus laying the exercise of the office continuously open to scandal—was amended. The office was made a salaried one, and the right

to collect and appropriate the fees on a totally different basis being no longer open to question, the service is now placed on a much more honorable as well as more economical footing. To Dr. Joseph Jones belongs the credit.

The special papers and reports on curative medicine also indicate an industrious Society, availing itself of the advances made in all its departments.

TRANSACTIONS OF THE TEXAS STATE MEDICAL ASSOCIATION, 1889. F. E. DANIEL, M.D., Secretary. Austin.

Three papers in this portly pamphlet are chiefly devoted to sanitary subjects, namely: the address of the President, J. F. Y. Paine, M.D., of Galveston, on State Medicine—"Public Hygiene, Medical Education, Medical Jurisprudence, and Public Institutions for the Sick and the Infirm;" "Tyrotoxicon and Peptotoxine," by J. W. Carhart, M.D., of Lampasas, and the "Climate of Western Texas," by M. A. Taylor, M.D., of Austin.

To a general statement of the importance of State medicine and citations of its life-saving benefits, Dr. Paine urges such practical legislation for Texas as will be worthy of the intelligence of all those of her people who have made themselves familiar with the subject. He pertinently asks: "Is State medicine necessary to the progress and dignity of the State of Texas; is it essential to the welfare of her people? No one will deny that the services of medical officers are essential to the efficient management of her hospitals and asylums. But what of her public health? Is it not equally important to have sanitary officers to watch over the execution of proper laws for prohibiting quackery and the sale of quack, fœticidal, poisonous, and adulterated drugs and food; to guard the health of the people by vaccination, quarantine, isolation, disinfection, and every other known means; and to provide for the registration of vital statistics—*i.e.*, marriages, births, and deaths, and also the prevailing diseases, with their causes?"

Surely there is but one answer to these inquiries, and it would be difficult to believe that there is, or that there is likely to be, any member of her Legislature so ignorant of their import as not to exert himself to do away with the reproach which their negation implies.

Dr. Carhart's paper is a statement in abstract of what Professor Victor C. Vaughn and others have done in bringing to light the resultant poison of milk, cheese, and cream, and their compounds, when not properly protected against the conditions promotive of their fermentation.

Dr. Taylor's laudation of the climate of Western Texas is based upon such natural conditions as are found to be promotive of health everywhere, when not brought into conflict with artificial conditions of man's devising in default of sanitary knowledge. That the salubrity of this great country may not be disturbed, it should be protected by the means contemplated in President Paine's address above noticed.

TRANSACTIONS OF THE MEDICAL AND CHIRURGICAL FACULTY OF MARYLAND, 1889. G. LANE TANEYHILL, M.D., Secretary. Pp. 264. Baltimore.

Preventive medicine in this report is comprised in two papers—one by the President, John Morris, M.D., on "Crime: Its Physiology and Pathogenesis; How Far Can Medical Men Aid in Its Prevention;" and "Quarantine—Report of the Section on Sanitary Science," by W. C. Van Bibber, M.D., Chairman.

Dr. Morris's address is an elaboration or, perhaps, more appropriately, medical application of a paper on the "Physiology of the Rogue," by Austin Abbott, LL.D. (read before the Society of Medical Jurisprudence and State Medicine, New York, February 9th, 1888; THE SANITARIAN, Vol. XX., p. 289). It deals with the possible sphere of the physician in the timely application of means to check and turn back the tide of hereditary influences—assuming heredity to be the common foundation of crime, with an attempt to sustain it by exceptional cases—such as that of the Juke family—with too little regard for environment, a far more potent agent. Yet, Dr. Morris remarks: "No man is born a criminal, as no man is born insane. He is born with a certain temperament, a certain constitution, so to speak, which proves a nidus under certain surroundings for the development of crime." The best physician for the young in crime is a well-appointed reformatory; for the old, punishment proportionate to the degree, even unto death.

Dr. Van Bibber's quarantine of the future contemplates

an elaborate "establishment built upon a large domain," depending for its sustenance and scientific benefit, apparently, upon a constant supply of quarantinable diseases to work upon —the primitive system, when there was but little attention given to the conditions which gave rise to infectious diseases and no effort made to prevent their exportation, when each and every community simply felt called upon to act on the defensive.

A "quarantine" of departure, such as that instituted at New Orleans in 1879, and such practical sanitation on board vessels of every class as should be exacted by all port health officers, should and would effectually do away with all such antiquated notions.

PROCEEDINGS OF THE THIRD ANNUAL CONVENTION OF THE NATIONAL ASSOCIATION OF BUILDERS, PHILADELPHIA, 1889. WILLIAM H. SAYWARD, Secretary. Boston, Mass.

This is a pamphlet of 200 pages, comprising propositions and discussions of trade interests, and the truly laudable principles which govern the Association—embodied in the appended declaration and constitution—no less beneficial to all who require the services of builders than to the builders themselves.

PAMPHLETS, REPRINTS, REPORTS, ETC., RECEIVED.

"Comparative Results of Ninety Cases of Pleurisy, with Special Reference to the Development of Phthisis Pulmonalis." Vincent G. Bowditch, M.D., Boston, Mass.

"Institutions for the Treatment of Pulmonary Consumption in the United States." Paul H. Kretzschmar, M.D., Brooklyn, N. Y.

"Concealed Pregnancy: Its Relations to Abdominal Surgery." A. T. Vanderveer, M.D., Albany, N. Y.

"Impurities in Potable Water, and Their Relations to Disease." Floyd Davis, M.Sc., Ph.D., Des Moines, Ia.

"The Education of Girls from a Medical Standpoint." Edward Jenks, M.D., LL.D., Detroit, Mich.

"A Popular Scientific Explanation of the Causes, Consequence, and Treatment of Nasal Catarrh." Charles A. Bucklin, A.M., M.D., New York.

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